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K-1-a BROWN

To

J. G. Jeffreys Esq. F.R.S. &c &c

with the Authors Compts.

K-1-a BROWN

THE

MOLLUSCA OF THE FIRTH OF CLYDE.

QL
425
G7B87
1878
Moll.

THE

MOLLUSCA

Division of Mollusks
Sectional Library

OF THE

FIRTH OF CLYDE,

BEING A CATALOGUE OF RECENT MARINE SPECIES

FOUND IN THAT ESTUARY.

By ALFRED BROWN.

"Erranti, passimque oculos per cuncta ferenti."—Virg. Æn.

GLASGOW:

HUGH HOPKINS, 85 RENFIELD STREET.

1878.

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PREFACE.

THE recent Mollusca of the Firth of Clyde and its numerous arms have, during the past half century, received a fair share of attention from our naturalists; nor is this to be wondered at, for the intermediate position which our river occupies between the northern and southern provinces of the British marine fauna, endows it with a numerous and varied store of material to reward the dredger. Here several species seem to reach their southmost limit, and here also may be found a few wanderers characteristic of more southern waters; added to which, the beauty of the scenery, the great facilities for travelling, and the numerous secluded and sheltered bays and lochs, in which work can be carried on in almost all weathers, combine to make the Clyde one of the most favourite stations for dredging operations.

Of the earlier local workers in this field it may be sufficient here merely to recall the familiar names of James Smith of Jordanhill, Dr. Landsborough of Saltcoats, Major Martin of Ardrossan, and Drs. Lorrain and Scouler of Glasgow; whilst in more recent years the zealous labours (happily still continued) of Mr. David Robertson have largely augmented our knowledge of the fauna of our Firth.

Of naturalists from across the Border who have given their attention to the marine mollusca of the Clyde, I may mention Joshua Alder, Edward Forbes, James M'Andrew, William Barlee, W. B. Carpenter, and Alfred M. Norman.

Resulting from the labours of so many investigators a good many lists of our mollusca have already been published, the most complete of which, as far as number of species is

concerned, are those by the late Mr. Smith of Jordanhill,* and by the late Dr. Landsborough,† whilst that by the Rev. A. M. Norman‡ is by far the most accurate and trustworthy; besides these, we have some partial lists, such as that in the late Dr. Bryce's well-known work,§ and in the dredging reports published from time to time in the annual volumes issued by the British Association. The last addition to our knowledge in this department appeared in a handbook‖ published in anticipation of the visit of the British Association to this city in 1876, and a corrected list of the mollusca therein catalogued has since been issued by Mr. David Robertson. This latter, however, embraces the whole area of the West of Scotland.

In presence of this already considerable literature bearing on the subject in hand, it will perhaps be asked what room remains for yet another catalogue? To this it may be replied that the lists already existing (with the exception of those by Dr. Landsborough and Mr. Robertson) are buried in half-forgotten or inaccessible journals; and with regard to the two exceptions, the first may be considered, without disrespect to the memory of its worthy and amiable author, by no means reliable; whilst the second, covering as it does the whole of the West of Scotland, does not constitute what is here attempted—a guide to the Molluscan Fauna of our own firth as limited by a line drawn from the south end of Kintyre to the heads of Ayr.

It is to furnish such a guide that I have ventured to prepare the following catalogue, and in doing so have gone upon the principle of including no species (as far as the

* In Memoirs of the Wernerian Society, published in 1838, and since republished, along with other papers by the same author, in "Researches in Newer Pliocene and Post-tertiary Geology." Glasgow, 1862.

† In "Excursions to Arran, Ailsa Craig, and the Two Cumbraes." Edinburgh, 1852.

‡ A Series of Papers in the "Zoologist," 1857-58-60.

§ "The Geology of Arran and the other Clyde Islands." Fourth edition. Glasgow, 1872.

‖ "Notes on the Fauna and Flora of the West of Scotland." Glasgow, 1876.

*testaceous** mollusca are concerned), which has not passed through my own hands, preferring to offer a less numerous list than some of my predecessors, rather than have any share in perpetuating error. The departures from this rule are, I think, only five in number, viz.:—(1) Rissoa abyssicola, a species established by Forbes on specimens dredged by him in Loch Fyne, and therefore, certainly authentic; and (2) Isocardia cor; (3) Arca lactea; (4) Littorina neritoides; (5) Scalaria communis, four species whose size and well-marked features seem to forbid the idea of any mistake having arisen.†

Two conspicuous and well known species — Pecten Islandicus and Saxicava (Panopea) Norvegica, not included in this list—occur occasionally in a more or less perfect condition in several parts of our firth, especially in Rothesay Bay. These, it is almost certain, are washed out of glacial clays, and are no longer living inhabitants of our waters, although it is still possible that the last named species, extending as it does on our eastern coasts as far south as Yorkshire, may yet be found alive in this estuary, where in former ages it flourished abundantly and attained a great size. On the other hand, three smaller species—Leda pygmæa, Cyclostrema (Mölleria) costulatum, and Trochus lineatus—here find a place, although they also have in all probability retired from the Clyde district, and are only now found in a dead state, and of very rare occurrence. One of them, however (Leda pygmæa), appears to enjoy a British distribution which overlaps the Clyde, and there thus remains a hope that it may still exist in some of

* The non-testaceous order, Nudibranchiata, has not received from me as much attention as has been given to the testaceous mollusca, and I have therefore been obliged to supplement my notes by additions from the lists already published by Alder, Robertson, Landsborough, and others, adding the authority for the inclusion of each species, so that the reader may estimate its value.

† This supposition is, however, hardly a safe one, as I have seen Scalaria Turtonæ, a conspicuous and easily known shell, exhibited in otherwise well-named collections as Scalaria communis; and in the public museum at Edinburgh errors as gross and unpardonable existed quite recently.

our deeper and less explored waters. Whether these inclusions are justifiable or not, due care has been taken that no mistake can arise either in respect of the species referred to above, or of others found in a similar condition, as it is noted under each species—unless such as are palpably common—whether it has been met with in a live or dead condition.

A frequent source of vitiation in many lists exists in the importation of alien species in ballast. From this we are happily free, or nearly so; as no ballast is permitted to be thrown into the sea by vessels entering our ports, and stringent regulations on this subject have been in force for many years. It is still probable that at times such vitiation may occur, but the notes as to the living or dead condition of the species catalogued afford a safeguard against error arising from such a cause.*

Under each species there has been added a short note on its British distribution, for information on which point I have to acknowledge my indebtedness to the works of Messrs. Forbes and Hanley, and J. G. Jeffreys, and to the various papers and local lists by Messrs. Alder, Forbes, Laskey, Leckenby and Marshall, M'Intosh, Robertson and Brady, and others, scattered through many periodicals, and also to the dredging reports published by the British Association in its annual volumes. A few foreign localities in which our Clyde shells have been found are also recorded; these are partly taken from private communications, but chiefly from the catalogues and notes published by Lovén, M'Andrew, Dawson, Gould, Verkrüzen, Jeffreys, and many others.† It is not pretended that an exhaustive list of such localities is here submitted, the books necessary for such research not being within my reach, but enough is given

* Helix lactea, an inhabitant of the Mediterranean seaboard, was lately dredged off Skelmorlie, in the lawful possession of a hermit crab; and I found a specimen of Oliva ispidula on the shore at Carradale.

† The late Dr. P. P. Carpenter's elaborate report on "The Mollusks of Western North America" (Washington, Dec., 1872), did not come into my hands in time to be made use of. It would appear from this revision of his former work that the matured judgment of its author led him to believe

to afford a fair idea of the facts (to those who care to analyse them) regarding the relations of our marine molluscan fauna to that of the surrounding countries.

The short synonymy appended to each species has unfortunately been drawn up in a hap-hazard manner, the necessity for a systematic method not having been recognised until too late. An asterisk has been prefixed to such shells as have been found in our Scottish post-tertiary deposits; my authority on this subject is solely the recently published "Catalogue of the Western Scottish Fossils" (Glasgow, 1876), which I accepted as a standard, presuming it to be brought up to the present level of knowledge, and thoroughly purged of every doubtful species, or such as had not been verified by competent judges. It is apparent, however, that in this particular the haste with which the book was compiled will tell against its usefulness, and that the pages devoted to the post-tertiary mollusca will require revision. I have adhered to the arrangement and nomenclature adopted by Mr. Jeffreys in his British Conchology, with a few trifling alterations of orthography or authority.

An appendix will be found at page 113, containing the species recorded in former lists but not included by me; the number, after suppressing synonyms, amounts to no less than sixty-three species, but of these we may safely dismiss all, except some eight or nine—the remainder resting upon authority too slight to be entitled to much respect; indeed it is now time that the unsupported records of Smith and

that of the species which are here catalogued from the Firth of Clyde only sixteen certainly extended their range to the north-western (Pacific) coasts of America, viz. :—

Lima subauriculata,	Axinus flexuosus,
Mytilus edulis,	Mya truncata,
Mytilus modiolus,	Pholas crispata,
Modiolaria marmorata,	Trochus helicinus,
Leda minuta,	Lacuna vincta,
Lasæa rubra,	Velutina lævigata,
Kellia suborbicularis,	Triforis perversa,
Lucina borealis,	Cerithiopsis tubercularis,

besides these three others are doubtfully present, viz.:—Nucula tenuis, Fusus antiquus, and Cylichna cylindracea.

Landsborough (upon whom the bulk of the species in the appendix are fathered) ceased to be repeated—but error and confusion of this sort die hard.

The best dredging stations within easy access of Glasgow are probably Rothesay and Kilchattan Bay in Bute, Millport in Cumbrae, and Lamlash in Arran, at all which places boatmen can readily be obtained. At Millport, William Thomson, and at Kilchattan Bay, Donald Glen, are very well acquainted with the work; at Rothesay, Daniel Reid can supply boats, men, and dredges if necessary; and at Lamlash I am informed that James M'Innes and James Leitch are good boatmen, and well acquainted with the dredging ground in the bay. During April and May, *i.e.*, after the white fishing has ceased, and before the herring have arrived, boatmen can probably be got at most of the fishing villages on the coast; but from June onward I have found it impossible to obtain men of the right sort, all being engaged at the herring fishery.

The equipment for dredging consists of a double-bladed galvanized iron dredge, which can be got, ready made with net attached, from Mr. R. Damon of Weymouth, or can be made to order for half that dealer's price by any intelligent working blacksmith—a piece of coarse sacking being used as a substitute for the net. The length of scraper which I find suitable is about 22 inches, the weight of the iron framework being 17lbs., but a heavier frame is probably required (say about 25lbs.) in water of greater depth than 35 or 40 fathoms. This is, of course, a mere matter of opinion—Mr. Robertson, for example, advocating the use of an instrument about half the size of the above. A board about 6 feet by 2 feet will be found very useful, laid across the boat's gunwales, for emptying the dredge upon; this board may farther be utilised when travelling by strapping the other gear upon it, and so concentrating the whole equipment into one package. A quantity of untarred Manilla rope, the length and thickness of

which will, of course, depend on the depth at which it is to be used; for anything under 40 fathoms $\frac{5}{8}$ths in. is sufficiently strong, the length required being about one-half more than the depth of water. A nest of copper wire sieves is also necessary for washing the material obtained; these may be $\frac{1}{4}$ in., $\frac{1}{8}$ in., and $\frac{1}{32}$ in. in the mesh, and about 14 in., 15 in., and 16 in. respectively in diameter. The frames should be of oak, or other wood which does not swell. Jars, bottles, and boxes may be added to the outfit, as may be thought desirable. A very old suit of clothes is *de rigeur*.

When a haul has been made, the dredge should be carefully emptied upon the board, and the material transferred in convenient quantities to the sieves, and washed in sea water either over the side, or if the boat is large enough, in a tub on board. The coarse material in the upper sieve may be examined and dismissed on the spot, whilst the finer stuff in the lower sieves should, after a cursory search for living specimens, be put into bags, labelled, and taken home for more leisurely examination. The finest material, which often contains the rarest specimens, should, when thoroughly dried, be placed spoonful by spoonful on a black japanned tray, and carefully turned over, grain by grain, with a camel hair pencil, an ordinary pocket lens being at hand for determining anything doubtful. This laborious examination is, I think, the *bête noire* of the dredger, but no more rapid method is possible—patience and enthusiasm will carry one through bushels of this residuum. All marine shells should be soaked for some time in fresh water before being packed up or placed in the cabinet, but care must be taken not to allow fragile species, or such as have a very delicate epidermis, to remain more than a few hours in fresh water, otherwise they may receive considerable damage.

As a general rule, when the water is deeper than four or five fathoms the dredge should not be dragged against the tide, as the current tends to lift it off the bottom and so prevents the scraper working properly. In stormy weather the naturalist will do well to devote himself to the littoral

species or to house work, but if he *must* dredge he will be wise to select a convenient spot on the shore, such as where there are flat clean rocks with deep rockpools, and there take up his stance, sending the boatmen seaward to the bank which is to be examined, spreading the material obtained on one of the rocks, washing it in the pools, and examining and sorting it at leisure, whilst the boatmen return to sea for a farther supply.

These remarks are, of course, only for such as are obliged, like myself, to hire small sail or rowing boats, and to make the most of a short holiday by gathering as much material as possible in the shortest space of time. Those on the other hand, who can command the use of large yachts, especially steam yachts, and whose time is not limited by other affairs, are quite differently situated, being more or less independent of the elements as well as being able to choose their working days; the discomfort of dredging in stormy weather with a small skiff is very great, and to such as do not possess strong stomachs, impossible.

In concluding this already too long preface I have only to express my indebtedness to Mr. David Robertson, of this city, for the opportunity afforded me of examining his unrivalled collection of Clyde shells, numerous references to which will be found in the following pages. To Mr. John Gray my thanks are specially due for his care in seeing this booklet through the press.

20 Huntly Gardens, *December*, 1877.

THE

MOLLUSCA

OF THE

FIRTH OF CLYDE.

Class BRACHIOPODA.

Family Terebratulidæ, *Gray*.

Terebratula, *Bruguière*.

* Terebratula caput-serpentis, *Linné*.

Anomia caput-serpentis and A. retusa, *Linné;* Terebratula aurita, *Fleming;* Terebratula pubescens, *O. F. Müller;* Terebratula costata *(young)*, *Lowe*.

Habitat.—On stony ground, from 15 fathoms downward, generally distributed in our firth. In Rothesay Bay I have taken it alive off Bogany Point outside the buoy, and at Ardmaleish Point; also off the Garroch Head and St. Ninian's Bay in Bute; outside the Tan Spit in Cumbrae (where it is scarce); off Moll Dhu and Silvercraigs, Loch Fyne; and at Lochgoilhead, about half a mile below Douglas Pier, on steamboat cinders, plentiful and fine, but restricted to a very small area. Mr. Norman reports it from Lamlash, between Holy Island and Hamilton's Rock. Forbes and others have found it very plentifully in Loch Fyne.

British distribution.—The headquarters of this species are in the western and northern seas of Scotland, extending to northern, western, and south-western Ireland.

Abroad, it is recorded from the northern and Arctic seas of both hemispheres, including Norway, Spitzbergen, Iceland, Greenland, Labrador, and Maine (the American specimens belong to the variety *septentrionalis*); and, farther south, we have it from the Mediterranean (*Mus. Risso*) and the Adriatic (*Brusina*). It does not, however, appear in M'Andrew's list from Vigo and northern Spain (*Liverpool, 1854*). Still farther afield it is said to inhabit the seas of Australia (*J. W. Flower*), Jamaica (*Barret* fide *Davidson*), and Japan (*Adams*).

This wide distribution in space may be matched by its equally great range in time; for if its identity with T. striata *(Wahlenberg)* be admitted, it existed far back in the cretaceous period, and is thus indeed one of those

> "jewels . . . . .
> That on the stretched forefinger of all time
> Sparkle for ever."

The comparison of this plain and sober looking shell to a jewel may seem far fetched even to a conchologist; but, whether it be by reason of its high lineage, old world aspect, or the interest connected with its discovery in British waters, few conchologists can see it—common though it be—brought up by the dredge,

> "That woo'd the slimy bottom of the deep,"

without a certain emotion.

Family Craniadæ, *King.*

Crania, *Philippson.*

Crania anomala, *O. F. Müller.*

Patella anomala, *Müller;* Patella distorta, *Montagu;* Orbicula Norvegica, *Lamarck;* Crania personata, *Sowerby;* Criopus anomalus, *Fleming.*

Habitat.—On stony ground, from 15 fathoms downward, in company with the preceding species, but common everywhere throughout the district on suitable ground; specially plentiful in Rothesay Bay, off Bogany.

British distribution.—Throughout the Scotch and Irish coasts; common.

Foreign localities.—Northern Europe generally, and in the south at Vigo (*M'Andrew*) and the Mediterranean (*Nares* and *Spratt*). It does not appear to have been noticed as an inhabitant of any part of North America except Greenland.

Class CONCHIFERA.

Order Lamellibranchiata.

Family Anomiidæ, *Gray.*

Anomia, *Linné.*

* Anomia ephippium, *Linné.*

Ostreum parvum, *Lister;* Anomia electrica and Anomia squamula, *Linné.*

Habitat.—From low water mark of ordinary tides down

to 40 fathoms, and probably to all depths, on stones, shells, and seaweeds. It is plentiful throughout the district, but seldom fine. The varieties are endless; and the principal ones (*squamula, aculeata,* and *cylindrica*) are all common.

British distribution.—Universally distributed, and generally common throughout the British Islands; Alder, however, reports it as "not common" on the Northumberland and Durham coasts. Unusually fine specimens are obtained at Loch Ryan.

Foreign localities.—Iceland (*Verkrüzen*), Norway (*Sars,* and others), Spain and Portugal (*M'Andrew*), Gibraltar Bay (*W. Brown*), Mediterranean, various collectors; Madeira (*M'Andrew*), Massachusetts (*Gould*), Canada (*Packard,* and others). It is commonly believed, and confirmed by M'Andrew, that the animal of this species is poisonous; but Lister states that he has eaten it, adding that it is held in esteem at Bordeaux (*Tres Tractatus,* p. 182).

* Anomia patelliformis, *Linné.*

Ostreum striatum, *Da Costa;* Anomia undulata, *Montagu.*

Habitat.—In 10 to 40 fathoms, on hard ground; the finest specimens being obtained from the insides of dead bivalves. It seems generally distributed over the district, but not plentiful. My best specimens were taken at Bogany and Toward Points. The variety *striata* is said by Mr. Norman to be abundant in the Clyde district.

British distribution.—Everywhere, on suitable ground, in company with A. ephippium; but it does not extend to the shore, or even to shallow water, as is the case with that species.

Foreign localities.—Norway and Sweden (*Sars, Lovén,* and others), Vigo (*M'Andrew*), Mediterranean (*Nares,* and others). It does not appear to be on record from north-eastern America, but is reported (doubtfully) from the North Pacific (*P. P. Carpenter*).

FAMILY OSTREIDÆ, *Broderip.*

OSTREA, *Linné.*

* Ostrea edulis, *Linné.*

Ostreum vulgare, *Lister.*

Habitat.—Gregarious in 1 to 3 fathoms. Small beds exist at the following stations:—Campbeltown Loch—south side, off the Battery; north side, off the Plantation; Loch Fyne,

near Tarbert; at the mouth of Loch Striven, opposite Rothesay; Loch Long, off Ardarroch; Balloch Bay, Cumbrae; and in the Holy Loch.

The variety *hippopus* is sometimes met with in Rothesay Bay, and *deformis* is not uncommon on the shore at low tide in various localities, of which Lamlash Bay and Campbeltown Loch may be specified; at both of these *parasitica* also occurs. Attempts at oyster culture have been made at the Holy Loch and Lochgoilhead, but have not been attended with success, although in the Holy Loch adventure considerable pains were taken to ensure it.

It is, of course, not easy to assign a reason for the frequent failure of oyster culture with us; but in the two cases named above it is probable that there is too great a deposit of sand and mud going on. A better locality would probably be found on either side of Campbeltown Loch; there are here already some small natural patches of oysters, the deposit of sand or mud is almost *nil*, and there is but slight disturbance from navigation.

British distribution.—Gregarious throughout our seas. The most extensive natural Scotch beds are at Loch Ryan and the Firth of Forth.

Foreign localities.—Iceland (*Mohr*), Norway (*Lovén*, and others), north and south of Spain and Portugal (*M'Andrew*), Mediterranean (*Jeffreys*), Mogador (*M'Andrew*) doubtfully.

Family Pectinidæ, *Lamarck.*

Pecten, *Bruguière.*

* Pecten pusio, *Linné.*

Ostrea pusio, *Linné;* Pecten minimus, etc., *Lister;* Pecten distortus, *Da Costa;* Ostrea sinuosa, *Maton* and *Rackett;* Hinnites sinuosus, *Deshayes.*

Habitat.—On hard ground in 8 to 25 fathoms, attached to stones and valves of bivalve shells; scarce. I have taken it in Rothesay Bay off Bogany House, and at Cumbrae outside the Tan Spit. Mr. Norman reports it from Lamlash.

British distribution.—Throughout all our seas; apparently common in Shetland, and on the east coasts of Scotland and northern England.

Foreign localities.—Norway (*Lovén*), Spain and Portugal (*M'Andrew*), Mediterranean (*Forbes*, and others), Canary Islands and Madeira (*M'Andrew*).

* Pecten varius, *Linné.*

Ostrea varia, *Linné;* Pecten tenuis, etc,. *Lister.*

Habitat. — Scarce in 10 fathoms off Silvercraigs, Loch Fyne, in stony and shelly ground, young live specimens only. Single valves are common everywhere. I have never taken this species adult and living; but Dr. Landsborough reports it from Lamlash, and Mr. David Robertson has dredged it frequently at Cumbrae in an adult state. The variety *nivea* has not been taken in the district, so far as I know.

British distribution.—Throughout the British seas, but probably not north of Orkney (*Jeffreys*). Forbes and Hanley state that " in Zetland it appears to be rare."

Foreign localities.—Norway (*Sars*), north and south of Spain and Portugal (*M'Andrew*), Mediterranean (*Forbes*), Red Sea (*M'Andrew*).

* Pecten opercularis, *Linné.*

Ostrea opercularis, *Linné;* Ostrea subrufa, *Pennant.*

Habitat.—Gregarious and very common in 8 to 25 fathoms, in sandy gravel, with nullipore and dead shells. The variety *lineata* I have only taken off Craigmore, Bute. The ordinary type is plentiful in Bute, off Bogany, Craigmore, and Ascog; on the Tan Spit, Cumbrae; off the Cock, Arran; and at Moll Dhu and Silvercraigs, Loch Fyne. The varieties of colour are very great, ranging from pure white to rich dark brown; pink, yellow, and deep orange colours are not uncommon; some in plain colours, and others mottled with pure white and dark brown. From the fishermen's accounts this species is by no means so common as formerly, the beds having been severely dredged for bait, and the supply thereby greatly reduced. This " clam" is much esteemed as an article of food, especially in winter and spring; but it does not enjoy so high a reputation in this respect as its big brother, P. maximus.

British distribution.—Everywhere on suitable ground; common.

Foreign localities.—Everywhere from Iceland to Madeira also in the Mediterranean and Ægean Seas.

* Pecten septemradiatus, *O. F. Müller.*

Pecten Danicus, *Chemnitz*; Ostrea hybrida, *Gmelin;* Pecten nebulosus, *Brown*; Pecten Jamesoni, *Smith.*

Habitat.—Although this species is probably common on suitable ground throughout the district, it is seldom or

never taken in the dredge, most specimens being obtained from the line fishers and the herring netsmen. It frequents rough stony ground, and this habitat is usually considered the reason why the species is so very seldom taken in the dredge. I think, however, that it owes its escape rather to its activity than to the nature of the bottom.

The headquarters of this fine species appear to be in Loch Fyne. Mr. Robertson and Mr. Norman have obtained it from off the Little Cumbrae, and the latter has also taken it off the east side of Holy Island, Arran.

British distribution.—West and north of Scotland, and as far south as Sunderland (*Alder*), but doubtfully.

Foreign localities.—Norway (*Lovén*, and others), Mediterranean and Ægean Seas (*Spratt*, *Forbes*, and others).

* Pecten tigrinus, *O. F. Müller.*

Pecten parvus, *Da Costa;* Pecten obsoletus, *Pennant.*

Habitat.—Very common on gravel mixed with sand and mud, in 10 to 40 fathoms; apparently distributed over the whole district. Very fine examples were obtained by me off Craigmore, Ascog, and Garroch Head, in Bute; and on a rough bank west of the Battery, Cumbrae. The shell is generally free, but sometimes attached by a byssus. The variety *costata* is also common.

British distribution.—Throughout our seas, but more plentiful in the north, and especially so on the western coasts of Scotland.

Foreign localities.—From Norway (*Sars*, and others), throughout the Dutch and French coasts, and as far as northern Spain (*M'Andrew*).

Pecten striatus, *O. F. Müller.*

Ostrea fuci, *Gmelin;* Pecten Landsburgi, *Forbes.*

Habitat.—In 15 to 20 fathoms, amongst stones and dead shells, attached by a byssus. It is not uncommon, but, so far as I know, never plentiful. My finest specimens were taken off Craigmore, Bute.

British distribution.—Northern and western coasts of Scotland; Isle of Man; and all Ireland. Alder records it from 50 fathoms, off the Northumberland coast.

Foreign localities.—Faröe Islands (*Mörch*), Finmark (*Lovén*), Norway (*Sars*), northern and southern coasts of Spain and Portugal (*M'Andrew*), Mediterranean and Adriatic (*Jeffreys*, in Supp. Brit. Con.).

* Pecten similis, *Laskey.*

Pecten tumidus, *Turton;* Pecten minimus, *Sars.*

Habitat.—In muddy sand and gravel, in 10 to 25 fathoms, off Ascog and Craigmore, Bute; Tan Spit, Cumbrae; Moll Dhu, Loch Fyne. A somewhat scarce species in a live state; single valves are common.

British distribution.—Local throughout all our seas, and at all depths from 2 to 95 fathoms.

Foreign localities.—Norway (*Sars* and others), northern and southern coasts of Spain and Portugal (*M'Andrew*), Mediterranean and Ægean (*Forbes*), Madeira, (*M'Andrew*).

* Pecten maximus, *Linné.*

Ostrea maxima, *Linné.*

Habitat.—In 8 to 30 fathoms in nullipore, sandy gravel and dead shells, somewhat scarce but generally distributed. I have taken it at Port Bannatyne Bay and Craigmore in Bute; outside Tan Spit, in Cumbrae, and off Moll Dhu and Silvercraigs, Loch Fyne. Dr. Landsborough reports a giant 8 inches long taken at Cumbrae; my largest specimen measures $6\frac{1}{8}$ inches in its greatest diameter.

This scallop is rightly held in high esteem by gastronomes. Lister tells us that "Hi pisces ex testaceis post ostrea maximè in deliciis sunt." Both this and P. opercularis are, however, rather too sweet and luscious to suit our modern taste.

British distribution.—Throughout our seas, apparently more common in the south and west of England than in Scotland. Scotch specimens, however, seem to attain a greater size.

Foreign localities.—Nearly everywhere from Norway (*Lovén*) to the Canaries (*M'Andrew*), but appears to be absent from the Mediterranean, where Pecten Jacobæus takes its place.

LIMA, *Bruguière.*

Lima elliptica, *Jeffreys.*

Habitat.—A single young specimen and one large valve of this species have been taken by Mr. Robertson, off Kilchattan Bay, Bute. I have not taken it myself, but have seen and verified the above named specimens.

It has probably been frequently confused with the following species, from which, however, it may readily be distinguished by the obliquity of the middle line. Forbes and Hanley figure the present species as Lima subauriculata. (F. and H., pl. liii., fig. 5.)

British distribution.—Hebrides, and western and northern coasts of Scotland; the Clyde being the most southern locality which I have noticed.

Foreign localities.—Norwegian coast (*Sars*, and others). Mr. Jeffreys gives also (in the supplement to his British Conchology) the Mediterranean, Adriatic, and Ægean Seas.

Lima subauriculata, *Montagu.*

Pecten subauriculata, *Montagu*; Lima elongata, *Forbes.*

Habitat.—In sandy gravel and nullipore off Craigmore, Bute; and on the Tan Spit, Cumbrae; in 8 to 15 fathoms. Rather scarce in a living state, but large single valves are common. Off Silvercraigs, Loch Fyne, it is common in 10 fathoms in muddy sand and dead shells.

British distribution.—Throughout all our seas, not uncommon, but full-sized living specimens seem everywhere scarce.

Foreign localities.—Greenland (*Möller*), Norway (*Lovén* and others), northern and southern Spain, Portugal, and the Canary Islands (*M'Andrew*), Mediterranean (*Forbes, M'Andrew,* and others).

Lima Loscombii, *G. B. Sowerby.*

Pecten fragilis, *Montagu;* Lima bullata, *Turton;* Lima fragilis, *Forbes.*

Habitat.—In muddy sand and nullipore off Shellbole Bay, Cumbrae, very fine specimens. This is the only locality where I have found adult living individuals. None of them were enclosed in a nest.

British distribution.—Generally distributed, but seemingly scarce everywhere.

Foreign localities.—Norway (*Lovén* and others), Gibraltar (*M'Andrew*), Mediterranean (*Forbes* and others).

Lima hians, *Gmelin.*

Ostrea hians, *Gmelin*; Lima tenera, *Turton*; Lima fragilis, *Fleming*; Lima aperta, *Sowerby*; Lima inflata, *Forbes.*

Habitat.—In 8 to 30 fathoms, in nullipore and hard

ground, gregarious and very abundant. Off Ardbeg Point, Bute, the dredge came up filled to the brim with these shells enclosed in their nests. It is also common on all the eastern and southern coasts of Bute; on the Tan Spit, Cumbrae; in Lamlash Bay, Arran; and generally throughout the district. The specimens from Bute furnished animals of a specially brilliant colour, exceeding in beauty any that I have taken elsewhere.

The somewhat nauseous smell given off by this mollusk does not protect it from the insatiable appetites of the cod and haddock.

British distribution.—The headquarters appear to be in the west of Scotland, but it extends generally over the northern, southern, and western portions of the British seas. It is not noticed by Alder in his list from Northumberland and Durham, nor by Messrs. Leckenby and Marshall in theirs from the Dogger Bank, and I do not know that it has been found anywhere on the eastern coast of England.

Foreign localities.—Widely distributed from Norway (*Lovén, Sars,* and others) to the Canary Islands (*M'Andrew*) as also in the Mediterranean Sea.

Family Mytilidæ, *Fleming.*

Mytilus, *Linné.*

*Mytilus edulis, *Linné.*

Musculus ex cæruleo niger, *Lister*; Mytilus ungulatus, *Linné*; Mytilus pellucidus and Mytilus incurvatus, *Pennant;* Mytilus Galloprovincialis, *Lamarck.*

Habitat.—Almost everywhere on gravel, stones, rocks, and timber; gregarious and very abundant from half-tide down to a fathom or so deep. There are extensive beds at Port-Glasgow, Row Point, and Ardrishaig; and smaller ones in many other localities in the district.

A small variety covers many of our piers, and inhabits the crevices in the rocks in vast numbers. Large specimens may be found singly or in small clusters in sandy bays, such as Fintry Bay, Cumbrae, at low tide.

This mussel, as is well known, is extensively used for food, but is looked on with suspicion by many, as it is said to possess, under certain conditions (which are unknown), unwholesome and even poisonous qualities. As a mercantile commodity its chief value is for bait; but Lister

states that in his day mussels were chiefly valuable for manure.

The variety *incurvata* is common, and a beautifully striped variety (*pellucida?*) is occasionally found. This latter I have taken at Campbeltown and Rothesay Bay, and also near Helensburgh.

British distribution.—Exceedingly abundant everywhere, especially in estuaries. In Scotland the best known beds are those in the Forth and Eden, on the east coast, and at Port-Glasgow in the Clyde.

Foreign localities (varieties included).—Greenland (*Fabricius*), Iceland (*Verkrüzen*), Maine (*Gould*), Lower Canada (*W. Brown* and others), Labrador (*Whiteaves*), Norway (*Lovén* and others), northern and southern coasts of Spain and Portugal and coast of Mogador and the Mediterranean (*M'Andrew*), St. Helena (*Jeffreys*). It is also said to inhabit the sea of Okhotsk (*Middendorff*).

* Mytilus modiolus, *Linné.*

Modiola Papuana, *Lamarck*; Modiola vulgaris, *Fleming.*

Habitat.—On rough stony ground from low water down to 12 or 15 fathoms, not uncommon but rather local. Stray examples of this species occur everywhere, but it is gregarious in the following localities which I have noted—Ardmaleish Point, Bute, fine and plentiful in 2 to 4 fathoms, and at lowest water of spring tides; Bogany Point, near the buoy; Toward Point; Holy Loch; and in shallow water, west side of Cumbrae, a little south of Fintry Bay. This mollusk is frequently infested by a pea crab (Pinnotheres) which lives in the folds of the gills; this parasite is common in the specimens from Rothesay Bay. The young of the present species are usually found in rough nests formed of stones, sand, and fragments of nullipore, bound together by byssal threads.

Fried in dripping, the Mytilus modiolus is said by the fishermen of Rothesay to be one of the best and sweetest shellfish for the table, an opinion which few will care to verify, as the animal has by no means an inviting appearance. The local name is "Clabach Dhu;" the more general vulgar name being "Horse Mussel."

British distribution.—The headquarters are the north and west of Scotland, but it extends over the greater part of England and Ireland, although not so common. On the Dogger Bank the Horse Mussel attains a great size, fully

9 inches long, in 40 to 50 fathoms. This is the farthest south station at which I know it to have been found in abundance, so much so as to "make sad work with the dredges" (*Leckenby* and *Marshall*). The distribution is decidedly northern.

Foreign localities.—Maine (*Gould* and *Say*), Labrador (*Whiteaves*), Iceland (*Steenstrup* and *Verkrüzen*), Spitzbergen and the Siberian Seas (*Middendorff* and others), Vancouver (*Carpenter*), Norway (*Lovén* and others).

Modiolaria, *Beck.*

Modiolaria marmorata, *Forbes.*

Mytilus marmoratus, *Forbes*; Mytilus discors, *Montagu*; Crenella marmorata, *Forbes* and *Hanley.*

Habitat.—At the roots of Laminariæ, and below stones, sparingly at low tide. Common in deeper water in the integument of Ascidia mentula, from a single individual of which I have extracted upwards of two dozen specimens, many of them large.

This species is very plentiful at Cumbrae wherever Ascidia mentula is found. I have taken it also at Craigmore and Callum's Hole, Bute; and at Moll Dhu, Loch Fyne. Landsborough states that Major Martin dredged it at Corriegills, Arran, "in the coriaceous coat of Ascidia rustica."

British Distribution.—Everywhere common. Very large specimens were obtained by Messrs. Leckenby and Marshall on the Dogger Bank.

Foreign localities.—Norway (*Asbjörnsen* and others), northern and southern coasts of Spain and Portugal (*M'Andrew*), Mediterranean (*Forbes* and others), Canary Islands (*M'Andrew*), North Western America (*Carpenter*).

* Modiolaria discors, *Linné.*

Mytilus discors, *Linné;* Mytilus discrepans, *Montagu;* Crenella discors, *Forbes* and *Hanley.*

Habitat.—In rock pools between half tide and low water, generally imbedded among the roots of Corallina officinalis or other small seaweeds. It is very common in such pools on the west side of the Battery Point, Cumbrae, where I obtained specimens measuring ½ inch by ¼ inch, which are the largest in my possession.

British distribution.—Everywhere throughout our seas, from the shore down to 30 fathoms (*Forbes*).

Foreign localities.—Greenland (*Fabricius*), Iceland, var. semilævis (*Verkrüzen*), Maine (*Binney*, and others), Labrador (*Whiteaves*), Spitzbergen (*Eaton*), Norway (*Lovén*). I have not found it recorded in M'Andrew's list from Spain, but Mr. Jeffreys includes the Ægean in its range.

Family Arcadæ, *Lowe.*

Nucula, *Lamarck.*

Nucula sulcata, *Bronn.*

Nucula decussata, *Sowerby.*

Habitat.—Scarce in Rothesay Bay in 20 fathoms, on a muddy bottom; only two or three specimens obtained. Mr. Barlee is said to have taken it at Tarbert, Loch Fyne; and Mr. Robertson has dredged it off Kilchattan Bay, Bute. It is evidently rare in our firth.

British distribution.—Sparingly distributed. The following localities are on record:—Oban and Raasay, in Scotland; Dublin and Bantry Bays, in Ireland.

Foreign localities.—Norway (*Lovén, Jeffreys*, and others), Spain and Portugal (*M'Andrew*), Mediterranean and Ægean Seas and Sea of Marmora (*Forbes, Spratt*, and others).

* Nucula nucleus, *Linné.*

Arca nucleus, *Linné;* Arca margaritacea, *Bruguière;* Nucula margaritacea, *Lamarck.*

Habitat.—In gravelly sand with an admixture of mud, from 8 fathoms downwards; very common throughout the district. The variety *radiata* is also obtained on the eastern side of Bute, and outside the Tan Spit, Cumbrae; but it is apparently scarce.

British distribution.—Both the type and variety *radiata* are common throughout our seas at all depths, from a few fathoms downward.

Foreign localities.—Very widely distributed from Faröe Islands and Norway (*Torell*, and others) to Spain, Portugal, and Mogador (*M'Andrew*), and throughout the Mediterranean and Ægean (*Forbes*, and others).

* Nucula nitida, *G. B. Sowerby.*

Arca nucleus (probably), *Montagu.*

Habitat.—In sandy and muddy gravel, from 8 to 30

fathoms; very common. I have taken this and the last species almost everywhere in the Clyde district; specially fine specimens of the present species at Lochgoilhead, a little below Douglas Pier, in about 15 or 18 fathoms. Rayed specimens are not uncommon. Mr. Norman considered this species very rare, although he dredged Cumbrae (where I found it abundant) pretty thoroughly.

British distribution.—Except in the Clyde district this species seems much rarer than the preceding one, but is dispersed over all our seas from low water (at Swansea) to great depths.

Foreign localities.—Greenland (*Mörch*), Norway and Sweden (*Lovén*, and others), northern and southern coasts of Spain and Portugal (*M'Andrew*), Mediterranean (*Jeffreys*).

* Nucula tenuis, *Montagu.*

Arca tenuis, *Montagu.*

Habitat.—Rather sparingly met with in muddy gravel, from 15 fathoms downward, in Rothesay Bay and east side of Bute; and outside the Tan Spit, Cumbrae. Locally plentiful opposite Otter, Loch Fyne; and at Lochgoilhead, about half a mile below Douglas Pier, in 18 fathoms, where fine specimens are obtained.

British distribution.—Throughout Scotland and north of England this species is frequently met with in deepish water. Alder reports it as not uncommon in Northumberland; but it is not included in Messrs. Leckenby and Marshall's list from the Dogger Bank. It occurs sparingly in the north-east of Ireland.

Foreign localities.—Massachusetts (*Gould*), Gulf of St. Lawrence (*Whiteaves*); Iceland (*Verkrüzen*), Norway and Sweden (*Sars*, and others), Brittany (*Cailliaud*), Mediterranean and Ægean (*Forbes*, and others). It is not included in M'Andrew's list from Spain and Portugal. The variety *inflata* was obtained by Captain Feilden in Discovery Bay 81° 41′ N. lat.

LEDA, *Schumacher.*

* Leda pygmæa, *Münster.*

Nucula pygmæa, *Münster;* Nucula tenuis, *Philippi* (not *Montagu*); Nucula gibbosa, *Smith.*

Habitat.—I have only taken single valves of this species in Rothesay Bay, and in deep water outside Cumbrae. These valves are quite possibly remains of the glacial period. I

do not know that this species has been taken alive in our firth.

British distribution.—Apparently very local; found in the Sound of Skye, the Minch, and Shetland; also off the Antrim coast (*Jeff. Brit. Con.*).

Foreign localities.—Greenland (*Möller*), Norway and Sweden (*Asbjörnsen, Lovén,* and others), Mediterranean (*Nares*). It is said also to have been taken in the Bay of Biscay. Not named by Gould, Dawson, or Whiteaves as an inhabitant of the American Atlantic coast, the headquarters of the group to which this species belongs.

* Leda minuta, *O. F. Müller.*

Arca minuta, *Müller;* Arca caudata, *Donovan;* Leda caudata, *Forbes* and *Hanley.*

Habitat.—Not uncommon amongst muddy gravel and stones on east side of Rothesay Bay, nearly opposite Bogany House, in 15 fathoms. Elsewhere it is somewhat scarce; but occurs generally throughout the district. On a rough bank of stones and mud, outside Tan Spit, Cumbrae, I have taken good specimens, the largest $\frac{6}{10}$ of an inch broad.

British distribution.—Not uncommon throughout all Scotland, and north-eastern England as far as the Dogger. Scarce, but generally distributed, in south and west of England, and on the Irish coast.

Foreign localities.—Massachusetts (*Gould*), Gulf of St. Lawrence (*Dawson* and *Whiteaves*), Greenland (*Fabricius*), Norway (*Lovén,* and others). Captain Feilden, of the recent Arctic Expedition, collected the variety *complanata* in 80° 2′ N. lat., 70 fathoms.

PECTUNCULUS, *Lamarck.*

Pectunculus glycimeris, *Linné.*

Arca glycymeris, *Linné;* Arca pilosa, *Montagu;* Pectunculus pilosus, *Forbes.*

Habitat.—I have not taken this species alive—only single valves. Mr. Norman reports it from deep water, north-east of Holy Island; and Mr. D. Robertson has found it not uncommonly off Cumbrae, in a living state.

British distribution.—Gregarious over almost all our coasts, "preferring a nullipore bottom in from 15 to 25 fathoms" (*Forbes* and *Hanley*). It is not uncommon in the English Channel.

Foreign localities.—Norway (*Sars*), northern and southern coasts of Spain and Portugal, Madeira, and Canaries (*M'Andrew*), Mediterranean and Ægean (*Nares*, and others).

ARCA, *Linné.*

Arca lactea, *Linné.*

Arca barbata, *Pennant;* Arca crinita, *Pulteney;* Arca perforans, *Turton.*

Habitat.—Although I have never taken this species, nor seen an authentic Clyde specimen, it is included here on account of its frequent occurrence in Dr. Landsborough's lists, and the partial confirmation of its capture obtained by Mr. Norman from the boatmen employed by Major Martin and Dr. Landsborough. It is a species that could hardly have been mistaken by the Rev. Doctor for any other living Clyde shell. Mr. Norman says: "Two or three were taken, some years since, near the Corriegills, Arran, by Dr. Landsborough and Major Martin; but John Kelso (boatman), who accurately described the shells, tells me that, though he has repeatedly dredged there since, expressly for it, it has not since been met with." Subsequent dredging has not, to my knowledge, confirmed the presence of this southern form in our waters.

British distribution.—The British seas south of Scotland, becoming more common in the south of England and the Channel Islands. It is reported from Oban, and (as above) from Arran.

Foreign localities.—French Atlantic coast, north and south of Spain, Mogador, and Canaries (*M'Andrew*); Mediterranean and Ægean (*Forbes*, and others).

FAMILY KELLIIDÆ, *Forbes* and *Hanley.*

LEPTON, *Turton.*

* Lepton nitidum, *Turton.*

Kellia nitida, *Forbes* and *Hanley.*

Habitat.—In gravel and nullipore, in about 20 fathoms; scarce. I have taken this species living off Silvercraigs and Otter Spit, Loch Fyne; and single valves east side of Cumbrae, and also at Craigmore, Bute. Mr. Norman records a single specimen from Lamlash Bay, Arran.

British distribution.—Generally distributed throughout our seas, but somewhat local.

Foreign localities.—Dröbak (*Jeffreys*); French Atlantic

coast (*De Folin*); Mediterranean and Ægean (*Nares*, and others).

MONTACUTA, *Turton.*

Montacuta substriata, *Montagu.*

Mya substriata, *Montagu.*

Habitat.—I have frequently taken this species on the Tan Spit, and west side of Little Cumbrae, in 8 to 25 fathoms, sandy mud, living on the ventral spines of Spatangus purpureus. It has also occurred to me off Otter, Loch Fyne. Dr. Landsborough and others report it from Lamlash Bay.

British distribution.—On all parts of our coast parasitic on Spatangus, and (occasionally) on Amphidotus.

Foreign localities.—Norway (*Sars*, and others); northern France (*Petit*); Spain (*M'Andrew*); Mediterranean (*Nares*, and others).

* Montacuta bidentata, *Montagu.*

Mya bidentata, *Montagu;* Petricola bidentata, *Gray;* Mesodesma exiguum, *Lovén.*

Habitat.—On a muddy gravel bottom, in 8 to 25 fathoms, throughout the district, but generally dead. Very common at Lochgoilhead, opposite Douglas Pier, in about 6 fathoms water, where fine live specimens were obtained. I have also taken this species living at Little Cumbrae, off "The Hawk," and at Ardrishaig, off the Pier. Single valves and dead pierced shells are very abundant almost everywhere.

British distribution.—Throughout all our seas from Shetland to the Channel Islands.

Foreign localities.—Norway (*Sars*), Sweden (*Malm*), northern Spain (*M'Andrew*), Mediterranean (*Nares, Jeffreys*, and others), Madeira (*Johnson*).

* Montacuta ferruginosa, *Montagu.*

Mya ferruginosa, *Montagu;* Montacuta tenella, *Lovén;* Tellimya elliptica, and T. glabra, *Brown.*

Habitat.—In 6 to 15 fathoms, on muddy bottom; scarce in a living state, but single valves are rather common in many localities in the district. I have taken living and fine examples of this species off the pier at Ardrishaig, in 6 fathoms, or rather less; also off Garroch Head, Bute. Mr. Norman met with it in Millport Bay on the beach after storms.

British distribution.—Very scarce, but widely distributed.

Forbes and Hanley enumerate about a score of localities, scattered over the British and Irish coasts; the south-east of England, however, is not represented. Messrs. Leckenby and Marshall state that this Montacuta frequents the spines of Spatangus purpureus; but unlike its relative, M. substriata, the present species takes up its abode on the dorsal area of the urchin. I have not met with any confirmation of this rather singular habitat.

Foreign localities.—Norway, (*Sars*), Sweden (*Lovén*), western France (*Lafont*), Spain, Mogador, and the Mediterranean (*M'Andrew*).

Lasæa, *Leach.*

Lasæa rubra, *Montagu.*

Cardium rubrum, *Montagu;* Kellia rubra, *Turton;* Poronia rubra, *Recluz.*

Habitat.—Under stones, in crevices of rocks, and at roots of small seaweeds between tide marks. This species is exceedingly abundant in Cumbrae, from Farland Point to Fintry Bay; and it is probably common throughout the whole district in suitable situations. I have noticed it at Gourock, Rothesay, Lochs Long, Goil, and Fyne. Mr. Norman reports the type and a white variety from Lamlash.

British distribution.—On most of our rocky coasts, abundant but somewhat local. It rarely occurs below the laminarian zone.

Foreign localities.—From northern France to Spain, the Canary Islands, and Madeira (*M'Andrew*), and throughout the northern shores of the Mediterranean. Mr. Jeffreys (in Brit. Con.) states that it has been found by Steenstrup in Iceland, and by Lilljeborg in Norway. The distribution is, however, almost entirely southern. Shells said to be identical with this are found on the Pacific Coast of North America and in Magellan Straits.

Kellia, *Turton.*

Kellia suborbicularis, *Montagu.*

Mya suborbicularis, *Montagu;* Tellimya suborbicularis, *Brown.*

Habitat.—In mud in the cavities of dead shells (bivalves and univalves), not common. I have taken it in 10 to 14 fathoms, off St. Ninian's Bay and Garroch Head, Bute; and in 18 to 20 fathoms outside the Tan Spit, Cumbrae, on a bank of rough boulders, mud, and dead shells.

British distribution.—Generally distributed throughout our seas, from low water to all depths, but apparently rather scarce. On the Dogger Bank and Northumberland coast it seems somewhat common (*Alder* and others).

Foreign localities.—Norway (*Lovén, Jeffreys,* and others), north and south of Spain and Portugal and Canary Islands (*M'Andrew*). This is another species to which an almost world-wide range has been attributed.

Family Lucinidæ, *D'Orbigny.*

Lucina, *Bruguière.*

* Lucina spinifera, *Montagu.*

Venus spinifera, *Montagu*; Myrtea spinifera, *Turton*; Lucina hiatelloides, *Philippi.*

Habitat.—In about 12 fathoms, muddy gravel, west side of Cumbrae; and in similar bottom, in 10 and 15 fathoms, off Otter and Moll Dhu, Loch Fyne; scarce, and not full-grown.

British distribution.—The headquarters seem to be in the west of Scotland, and it is specially plentiful in Oban Bay. Generally distributed over our seas, but becoming (it is said) scarce in the south of England. Still further south, at the Canaries, this species is reported as common.

Foreign localities.—Norway (*Lovén*); Spain, Portugal, Mogador, Canary Islands, and Madeira (*M'Andrew*); Mediterranean and Ægean (*Nares* and others).

* Lucina borealis, *Linné.*

Venus borealis, *Linné*; Tellina radula, *Montagu*; Venus spuria, *Gmelin.*

Habitat.—I have taken this species in Kames Bay, Cumbrae, in 2 or 3 fathoms, on a sandy bottom; and good specimens are frequently cast up by the sea on Millport sands. I have also taken it occasionally outside Tan Spit, Cumbrae; and at Ascog, in Bute; Loch Fyne, off Silver-craigs, young specimens only. Mr. Norman says it is not uncommon in shallow water, just off the pier at Lamlash. I have a specimen of the variety *gibba,* from Moll Dhu, Loch Fyne.

British distribution.—On all our coasts, rather common.

Foreign localities.—Norway (*Lovén*), Spain (*M'Andrew*), also Mogador doubtfully; Mediterranean and Sea of Marmora (*Spratt*), North America (*Gould,* and others), doubtfully.

AXINUS, *J. Sowerby.*

* Axinus flexuosus, *Montagu.*

Tellina flexuosa, *Montagu;* Lucina flexuosa, *Fleming;* Cryptodon flexuosum, *Turton.*

Habitat.—In muddy sand and mud, from 8 fathoms downward; nearly everywhere. It is specially plentiful in Rothesay Bay, in 15 to 20 fathoms, muddy bottom. Single valves are everywhere common in deep water.

British distribution.—More or less common in all British and Irish seas on muddy ground.

Foreign localities.—Iceland (*Verkrüzen*), Spitzbergen (*Torell*), Massachusetts (*Gould*), Norway (*Lovén*, and others), Spain, Mogador, and Canary Islands (*M'Andrew*), Mediterranean and Ægean (*Forbes*, and others).

* Axinus ferruginosus, *Forbes.*

Kellia ferruginosa, *Forbes;* Lucina ferruginosa, *Forbes* and *Hanley.*

Habitat.—This insignificant shell is one of the dredger's prizes. It frequents deepish water; and is exceedingly scarce, in the sense of local. I have taken it alive in 25 fathoms in Loch Goil, about half a mile below Douglas Pier, on a bottom of muddy sand; also at Moll Dhu, Loch Fyne, on similar ground. My largest specimen is barely an eighth of an inch in breadth; it is from Loch Goil. Mr. Robertson has taken it in Loch Fyne, off Inveraray.

British distribution.—Loch Fyne, the Sound of Skye, the Hebrides, and Shetland are the only localities given by Mr. Jeffreys in "British Conchology."

Foreign localities.—Greenland (*Torell*), Norway (*Lovén* and *Jeffreys*), Spain (*M'Andrew*), Mediterranean (*Nares*), Ægean (*Forbes*).

FAMILY CARDITIDÆ, *Gray.*

CYAMIUM, *Philippi.*

* Cyamium minutum, *O. Fabricius.*

Venus minuta, *Fabricius;* Mya purpurea, *Montagu;* Erycina purpurea, *Recluz;* Lesæa minuta, *Möller;* Turtonia minuta, *Forbes* and *Hanley.*

Habitat.—Rather common among the roots of Corallina officinalis and below stones, at low water mark and a little

above it, at Battery Point, Cumbrae. This is the only locality I happen to have noted; but it is probably more or less common on all suitable ground in the district. Mr. Norman has taken it both in Cumbrae and Arran "in some plenty."

British distribution.—Throughout our seas, in the littoral and laminarian zones, in sheltered situations.

Foreign localities.—Greenland (*Fabricius*), Massachusetts (*Stimpson*), Norway (*Lovén*), northern France (*Macé*, and others), Mediterranean (*Jeffreys*).

Family Cardiidæ, *Broderip.*

Cardium, *Linné.*

* Cardium echinatum, *Linné.*

Cardium parvum (young), *Da Costa.*

Habitat.—Sand and gravel, in 6 to 20 fathoms; not uncommon, and generally distributed throughout the district. I have taken this fine, though common shell, living, on Bogany Point, Toward Point, and off Craigmore and Ascog in Bute; on Tan Spit and off Fintry Bay, Cumbrae; and in Loch Fyne. Mr. Norman has taken it in Lamlash Bay. The shells, when adult, are usually coated with a ferruginous deposit.

British distribution. — Common throughout all our seas.

Foreign localities.—Everywhere from Greenland (*Fabricius*) and Iceland (*Verkrüzen*) to the Canaries (*M'Andrew*), as well as throughout the Mediterranean and Ægean Seas and Sea of Marmora (*Forbes*, and others).

* Cardium exiguum, *Gmelin.*

Cardium pygmæum, *Donovan.*

Habitat.—On soft dirty ground, in 6 to 8 fathoms; scarce. I have taken it off "the Hawk," Little Cumbrae; outside Tan Spit, Cumbrae; at Bogany Point, Bute; and off Otter, Loch Fyne: only one or two specimens from each locality.

British distribution. — General throughout the British Isles; but probably abundant nowhere.

Foreign localities.—From Norway and Sweden (*Sars*, and others) to northern France, Spain, Portugal, throughout the Mediterranean, and as far as the Black Sea (*Middendorff*).

* Cardium fasciatum, *Monagu.*

Cardium elongatum, *Turton;* Cardium exiguum, *Macgillivray.*

Habitat.—This species may be obtained nearly everywhere throughout the district, in 5 to 30 fathoms, in sandy gravel with an admixture of mud. It is very common at Bogany, Craigmore, and Ascog, Bute; on Tan Spit and west side of the two Cumbraes; and in Loch Fyne, off Silvercraigs and Otter. Specimens more globose than the type sometimes occur. These may be the variety *globosa.*

British distribution. — Throughout the British Isles common.

Foreign localities.—From Iceland (*Verkrüzen*), throughout northern and western Europe, and as far as the Canary Islands (*M'Andrew*), Mediterranean (*Nares, Jeffreys,* and others).

Cardium nodosum, *Turton.*

Cardium roseum, *Lamarck* (*not* C. nodosum, *Montagu*).

Habitat.—Scarce on gravelly bottom, from 10 to 25 fathoms, at Bogany Point and Ascog, in Bute; and off the Battery, Cumbrae. Only one or two specimens were obtained at each locality; Mr. Norman, however, reports it as "by no means uncommon" at Shell Bay, Cumbrae; Largs; Lamlash Bay, and between that and Corriegills, Arran.

British distribution.—Generally diffused throughout our seas; rather a scarce species; but it is locally common in various districts.

Foreign localities.—Norway (*Lovén,* and others), northern and western France (*Jeffreys*), and both sides of the Mediterranean as far as Sicily (*Philippi*).

* Cardium edule, *Linné.*

Pectunculus vulgaris, *Lister;* Cardium vulgare, *Da Costa.*

Habitat.—Gregarious and abundant in sandy bays, from half tide downward. It seems to prefer a mixture of gravel with sand; and flourishes best where a small fresh water stream percolates the beach, rendering the water more or less brackish. In this district there are many beds, from which considerable quantities of this common shell are collected for sale in the large towns. I may specify such beds:—at Ardentinny, in Loch Long; at Kamesburgh and Ettrick Bays, Bute; at Lochgilphead, Argyleshire; as

also (I am told) at intervals along the whole coast of Ayr. Our beds, however, will not compare in size or value with many along the coasts of England and Wales. The gastronomic merits of the cockle have been well known and appreciated by man for untold ages; birds do not despise it; and the predatory mollusca have a special *penchant* for this juicy morsel. Yet in spite of such persecution it still survives, possibly in as great abundance as ever—a good example of

> " . . . the seas abundant progeny,
> Whose fruitfull seede farre passeth those in land."

British distribution.—Everywhere on suitable ground; one of our commonest bivalves.

Foreign localities.—Iceland (*Mohr*), Norway (*Lovén*, and others), Spain, Portugal, and Mogador (*M'Andrew*), Ægean (*Forbes*), Caspian Sea (*Middendorff*, and others).

Cardium minimum, *Philippi.*

Cardium Suecicum, *Lovén.*

Habitat.—In sand and nullipore; apparently scarce. I have taken it living on the Tan Spit, Cumbrae, and at Bogany Point, Bute; but have only obtained some half-dozen specimens.

British distribution.—Chiefly on the western and northern coasts of Scotland, and in most parts of Ireland; but everywhere scarce.

Foreign localities.—Norway (*Lovén*, and others), Brittany (*Cailliaud*), Spain and Portugal (*M'Andrew*), Mediterranean and Ægean (*Nares*, and others).

* Cardium Norvegicum, *Spengler.*

Pectunculus maximus, *Lister;* Cardium lævigatum, *Pennant* (*not* C. lævigatum of *Linné*); Cardium serratum, *Lamarck;* Cardium oblongum, *Brown.*

Habitat.—Everywhere throughout the district, in sand and nullipore, in 8 to 30 fathoms; not uncommon. Toward, Bogany, and the Ascog shore, in Bute, and Tan Spit, Cumbrae, may be named as localities where this species may readily be found.

British distribution.—Everywhere throughout the British seas, in sand, nullipore, and gravel.

Foreign localities.—Norway (*Lovén*, and others), Spain, Portugal, Canaries, and Madeira (*M'Andrew*), Mediterranean (*Martin*, and others).

FAMILY CYPRINIDÆ, *Geinitz.*

ISOCARDIA, *Lamarck.*

Isocardia cor, *Linné.*

Chama cor, *Linné;* Cardium humanum, *Linné.*

Habitat.—I have never found even a fragment of this shell; but Mr. Norman states that he took two or three single valves in deep water between the Cumbraes. Living, as it does, in considerable abundance in the Irish Sea, and being occasionally found at Oban and Iona, as well as on the Galloway coast, there is nothing to prevent this species finding a home in our firth. The occurrence of two or three single valves can scarcely be accounted for in the same way as we account for a like occurrence of Pecten Islandicus, &c., as I believe Isocardia has not been met with in any of our post-tertiary deposits. It is not named in the recently published "Catalogue of the Western Scottish Fossils," a list, the thoroughness of which is guaranteed by the names on the title page. These valves found by Mr. Norman may have been thrown overboard from some fishing boat returning from the herring fishery on the Irish coast.

British distribution.—Cornish coast; south and east of Ireland, being chiefly at home on the Dublin coast; Mull of Galloway; Iona, and other localities on west and north-west of Scotland; also found by Dr. M'Intosh at St. Andrews.

Foreign localities.—From Norway (*Jeffreys*), throughout western Europe to the Mediterranean and Ægean (*Nares*, and others).

CYPRINA, *Lamarck.*

* Cyprina Islandica, *Linné.*

Venus Islandica, *Linné;* Pectunculus crassus, *Da Costa;* Cyprina vulgaris, *Brown.*

Habitat.—In muddy sand; nearly everywhere. I have taken it on all sides of Rothesay Bay; east and south sides of Bute; west side of Cumbrae, and on the Tan Spit. Young shells are very common, but living adult specimens are (in my experience) seldom taken by the dredge; large and fine dead individuals are, however, often obtained. My largest specimen is from Kilbrennan Sound, and measures $4\frac{1}{2} \times 4\frac{3}{4}$ inches. It was taken by the long line fishermen; and I owe it to the kindness of Captain Kerr of Campbeltown.

British distribution.—Everywhere throughout our seas; very common. Lister, who gives a good figure of this species

in his "Tres Tractatus," states that it is found most abundantly on the sandy beach at the mouth of the Tees.

Foreign localities.—Massachusetts (*Gould*), Gulf of St. Lawrence (*Whiteaves*), Iceland (*Verkrüzen*), Norway (*Lovén* and *Jeffreys*), Brittany (*Taslé*).

Astarte, *J. Sowerby.*

* Astarte sulcata, *Da Costa.*

Pectunculus sulcatus, *Da Costa*; Venus Scotica, *Maton;* Venus Danmonia, *Montagu;* Crassina Danmoniensis, *Lamarck;* Astarte Scotica, *Fleming;* Venus compressa, *Linné.* The variety elliptica is the Crassina ovata and C. elliptica of Brown; Astarte elliptica of Möller, Lovén, Forbes and Hanley, and others.

Habitat.—In deep water, from 20 fathoms downward; not uncommon. I have taken it outside Tan Spit, and off the Little Cumbrae; off Garroch Head, and Ascog, and in Rothesay Bay, Bute; and off Otter Spit and Moll Dhu, Loch Fyne; generally on a muddy bottom. Adult shells are almost always coated with a thick black deposit.

The varieties *Scotica* and *elliptica* occur sparingly; of each I have only taken one adult specimen, and a few young shells.

British distribution.—On all our coasts, generally in deepish water; much more common in the west and north of Scotland than elsewhere.

Foreign localities.—Including the varieties *elliptica* and *incrassata* this species extends over the Atlantic coasts of America from Massachusetts northward, to Greenland, Iceland, and Spitzbergen, throughout northern and western Europe and the Mediterranean and Ægean Seas. M'Andrew records it from the Canary Islands.

* Astarte compressa, *Montagu.*

Venus compressa, *Montagu;* Venus Montagui, *Dillwyn;* Nicania striata, *Leach;* Astarte Banksii, *Lovén.*

Habitat.—In sand and nullipore, in 10 to 12 fathoms off Silvercraigs, Loch Fyne; not uncommon. This is the only locality within the firth in which I have taken it; Mr. Robertson, however, records it as moderately common off Cumbrae.

British distribution.—Western, northern, and eastern coasts of Scotland; and north-eastern England as far south as the Dogger Bank.

Foreign localities.—Gulf of St. Lawrence, as A. Banksii

(*Whiteaves*), Maine (*Gould*), Iceland (*Verkrüzen*), Spitzbergen (*Torell*), Norway (*Lovén* and *Jeffreys*). The variety *striata* was obtained in 79° 25′ N. lat. by the Naturalists to the recent Arctic Expedition.

Astarte triangularis, *Montagu.*

Mactra triangularis and M. minutissima, *Montagu;* Goodallia triangularis and G. minutissima, *Turton.*

Habitat.—I have not met with this species alive in the Clyde district; but dead shells (single valves) occurred off Silvercraigs, Loch Fyne, in about 12 fathoms. Mr. Norman records it from Lamlash Bay; but the specimens were probably dead, being obtained from the "shell sand of Landsborough's Bay," a prolific corner for dead and worn shells.

British distribution.—Gregarious on many parts of our coasts from Shetland to the English Channel; a local species, but occasionally abundant.

Foreign localities.—Western Europe from Brittany southward, and extending as far as the Canary Islands (*M'Andrew*); it inhabits the Mediterranean (*Jeffreys*) and Ægean (*Forbes*).

Circe, *Schumacher.*

Circe minima, *Montagu.*

Venus minima and Venus triangularis, *Montagu;* Venus pumila, *Lamarck;* Cytherea minuta, *Brown.*

Habitat.—In nullipore, from 6 to 20 fathoms. Common and fine on Tan Spit, Cumbrae; apparently scarce in Rothesay Bay, where I have taken a few specimens on Bogany and Toward Points; moderately common on Craigmore and Ascog shores, Bute, and at Silvercraigs, Loch Fyne. The variations of colouring in this pretty shell are almost infinite; in this respect it rivals Pecten tigrinus.

British distribution.—Throughout all our seas, in sand and nullipore, from 8 to 50 fathoms; very common.

Foreign localities.—Finmark (*Sars*), Spain, Portugal, Madeira, and Canary Islands (*M'Andrew*), Mediterranean (*Nares*, and others).

Family Veneridæ, *Leach.*

Venus, *Linné.*

* Venus exoleta, *Linné.*

Pectunculus capillaceus, *Da Costa;* Artemis exoleta, *Forbes* and *Hanley.*

Habitat.—In sandy bays, just below ordinary low water,

and down to 10 fathoms. Large specimens are thrown up on the beach in many places; especially common under such conditions at Fintry and other bays on the west side of Cumbrae. Fine living specimens may be obtained at the very lowest ebb of spring tides between Fintry and Shell-bole Bays. From this locality I have my largest specimens, measuring $2\frac{1}{4} \times 2\frac{1}{4}$ inches. The fishermen at Millport have a name for this shell which savours too much of the older zoological authors to be printed in plain English.

Specimens from this district are seldom rayed so brightly as those from more southern latitudes; but the northern shells are larger.

British distribution.—Throughout our seas; common everywhere in sandy bays.

Foreign localities.—Norway (*Lovén*, and others), northern and southern Spain and Portugal (*M'Andrew*), and the Mediterranean Sea (*Payraudeau*, and others).

* Venus lincta, *Pulteney.*

Venus lupinus, *Poli;* Venus sinuata, *Turton;* Cytherea lunaris and C. lincta, *Lamarck;* Artemis lincta, *Forbes* and *Hanley.*

Habitat.—In deeper water than V. exoleta, in sand and nullipore; very common almost everywhere; fine living specimens, however, are scarce.

British distribution.—Throughout all our seas; very common.

Foreign localities.—Norway (*Lovén*), northern and southern Spain and Portugal (*M'Andrew*); also both sides of the Mediterranean and Ægean Seas.

* Venus fasciata, *Da Costa.*

Pectunculus fasciatus, *Da Costa;* Venus paphia, *Pulteney.*

Habitat.—I have taken this species under stones a little above low water of neap tides at Battery Point, Cumbrae; it is generally obtained, however, in 6 to 15 fathoms, in gravelly sand. Common on Tan Spit and west coast of Cumbrae; also at Bogany, Craigmore, and Ascog in Bute. Specimens ornamented with numerous and bright rays, and others having a greater or lesser number of ribs, are occasionally met with. These differences are hardly of varietal rank.

British distribution.—Everywhere throughout our seas; a common shell.

Foreign localities.—Norway (*Lovén*), northern and southern Spain and Portugal (*M'Andrew*), Mediterranean and Ægean (*Nares*, and others).

* Venus casina, *Linné.*

Pectunculus membranaceus, *Da Costa;* Venus lactea, *Donovan.*

Habitat.—Fine specimens off the western shoulder of Battery Point, Cumbrae, in nullipore and sand, in about 8 to 10 fathoms; young shells and single valves on the Tan Spit, and off Silvercraigs in Loch Fyne. Mr. Norman has taken it in Lamlash Bay. It is probably very local.

As Mr. Jeffreys states that scarcely anything is known of the animal, I append my notes on it:—Body—pale yellow, thickly speckled with still paler yellowish white. Tubes—colour as above, and generally speckled and blotched at the orifices with reddish brown; conjoined until near the orifices, where they separate. The edges of both orifices are encircled with cirri, which are generally speckled with brown; but in those individuals in which the orifices are not (or but slightly) so speckled, the cirri are also devoid (or nearly so) of that colour. The cirri of the incurrent tube appeared to be thicker and less numerous than those of the upper or excurrent tube; this latter frequently ejected water with some force.

British distribution.—Locally distributed throughout our seas, but not by any means common. It is recorded from the Northumberland coast by Alder; Dogger Bank, Leckenby and Marshall; also from Devonshire; Channel Islands; Welsh coast; Isle of Man; Ireland; and various localities on west and north of Scotland.

Foreign localities.—Norway (*Lovén*), Spain, Portugal, Madeira, and Canary Islands (*M'Andrew*), Mediterranean (*Nares*, and others).

Venus verrucosa, *Linné.*

Pectunculus strigosus, *Da Costa;* Venus erycina, *Pennant.*

Habitat.—I have only taken single and much worn valves of this species; but Mr. Robertson obtained a single live specimen from a fisherman, who took it on his lines, the supposed locality being off Garroch Head, Bute.

British distribution.—Chiefly in the south. It is reported from the Cornish and Devonshire coasts, Channel Islands, Welsh coast, and south of Ireland. Mr. Jeffreys has also taken it at Oban.

Foreign localities.—A range which includes the West

Indies, Africa, the Indian Ocean, and Australia, has been attributed to this species, whether rightly or not I cannot say. The following localities, however, are trustworthy, viz., the Atlantic coast of France, Spain, Portugal, Madeira, and Canary Islands (*M'Andrew*), Algiers (*Weinkauff*), Adriatic (*Olivi*), Sicilian and Corsican coasts (*Payraudeau*, and others), the eastern Mediterranean and Ægean (*Nares*, and others).

* Venus ovata, *Pennant.*

Cytherea ovata, *Fleming;* Venus pectinata, *Lamarck.*

Habitat.—In gravel and nullipore, from 6 fathoms downward. Very common at Bogany Point, and off Ascog and Craigmore in Bute; also on some parts of Tan Spit, Cumbrae; and generally throughout the district.

British distribution.—On all our coasts; a very common shell.

Foreign localities.—From Norway to the Mediterranean and Sea of Marmora.

* Venus gallina, *Linné.*

Pectunculus striatulus, *Da Costa;* Venus striatula, *Donovan;* Venus casina, *Pulteney.*

Habitat.—More or less common everywhere, from low water to all depths, on sandy, gravelly, or stony ground, but not in mud. Specially common in 2 or 3 fathoms water in sandy bays such as Kames and Fintry in Cumbrae. The varieties *laminosa* and *gibba* are also common, together with a number of intermediate forms.

British distribution.—Everywhere on sandy and nullipore bottoms, but especially in sand a little below lowest water of spring tides.

Foreign localities.—Iceland (*Steenstrup*), Norway (*Lovén*, and others), Spain, Portugal, Mediterranean, and Mogador (*M'Andrew*).

TAPES, *Mühlfeldt.*

* Tapes virgineus, *Linné.*

Venus virginea, *Linné;* Venus rhomboides, *Pennant;* Cuneus fasciatus, *Da Costa;* Pullastra virginea, *Brown.*

Habitat.—Rather common in the Clyde district, in sand and nullipore, from 8 to 30 fathoms water. Large and fine specimens may be obtained off Battery Point, Cumbrae, and

on the Ascog shore, Bute, in about 12 fathoms sand and nullipore.

British distribution.—Everywhere on sandy and nullipore ground; common.

Foreign localities.—From Norway (*Sars*, and others) to Spain and Portugal (*M'Andrew*), and throughout the Mediterranean (*Philippi*, and others).

Tapes pullastra, *Montagu.*

Venus pullastra, *Montagu;* Venus perforans, *Montagu;* Venerupis pullastra, *Fleming;* Pullastra vulgaris, *Brown.*

Habitat.—Littoral, between half tide and low water, in muddy gravel and sand, often sheltering beneath stones. It is common on the north and east coasts of Bute, and at Campbeltown, where also good examples of the variety *perforans* are to be got. On the Argyleshire coasts this shellfish, known as the *Merry fish* (Mary fish? or Maorach, *i.e.*, *shell*-fish), is much esteemed, being made into soup or roasted on the ribs in its own shell. I can testify to the excellence of its flavour and the tenderness of its flesh.

British distribution.—Everywhere throughout our seas; common.

Foreign localities.—From Norway (*Lovén*) to northern Spain (*M'Andrew*), and (as T. geographicus) to southern Spain, Portugal, and throughout the Mediterranean (*M'Andrew*, and others). Dunker records the variety *perforans* from Western Africa.

Tapes decussatus, *Linné.*

Venus decussata, *Linné;* Cuneus reticulatus, *Da Costa.*

Habitat.—Somewhat scarce between tide marks, in similar situations and in company with the foregoing species. I have taken it in Campbeltown Loch and Rothesay Bay. For culinary purposes no distinction is made between this species and T. pullastra—perhaps conchologists might do well to accept this *lex coqui.*

British distribution.—Local, but not uncommon on the southern, western, and northern coasts. It seems to be more scarce on the eastern side of our island, although occurring at many places, such as Scarborough (*Bean*), Northumberland (*Alder*), Berwick (*Johnston*); but it is not in Dr. M'Intosh's list from St. Andrews.

Foreign localities.—Northern and western France, Spain, Portugal, and throughout the Mediterranean and Ægean Seas.

Lucinopsis, *Forbes* and *Hanley*.

* Lucinopsis undata, *Pennant*.

Venus undata, *Pennant;* Venus inquinata, *Lamarck;* Lucina undata, *Brown;* Artemis undata, *Alder*.

Habitat.—In muddy sand and gravel, in Kames Bay and on the Tan Spit, Cumbrae; in Rothesay Bay, Bute; and off Otter Spit, Loch Fyne; generally in about 8 to 12 fathoms, but scarce and seldom good.

British distribution.—Everywhere in sandy bays throughout our isles, but not generally common; Dr. M'Intosh, however, says that it is thrown on the beach at St. Andrews, after storms, in vast numbers.

Foreign localities.—Norway (*Lovén* and *Sars*), Spain and Portugal (*M'Andrew*), Mediterranean and Ægean Seas (*Forbes*, and others).

Family Tellinidæ, *Latreille*.

Tellina, *Linné*.

Tellina crassa, *Pennant*.

Venus crassa, *Gmelin;* Pectunculus depressior, *Da Costa;* Tellina rigida, *Pulteney;* Arcopagia crassa and A. ovata, *Brown*.

Habitat.—Scarce in sand and nullipore, in about 6 to 8 fathoms. I have taken one specimen on the Tan Spit, Cumbrae, and one off Silvercraigs, Loch Fyne. Single valves occur pretty frequently.

British distribution.—On sandy ground throughout our seas. Scarce in western and northern waters, but common in the south-west of England and Ireland. It occurs on the Northumberland coast plentifully, as well as at St. Andrews and other east coast localities.

Foreign localities.—Norway (*Sars*, and others), Spain and Portugal (*M'Andrew*), Mediterranean (*Deshayes*, and others).

* Tellina Balthica, *Linné*.

Tellina solidula, *Pulteney;* Tellina parva, *Lister;* Tellina carnaria, *Pennant;* Tellina rubra, *Da Costa*.

Habitat.—Not uncommon but somewhat local, on muddy gravel and sand, between tide marks at Rothesay Bay and Kamesburgh Bay in Bute; Fintry Bay, Cumbrae; and at Lochgilphead; being plentiful and fine in the last-named

locality, where, and at Campbeltown, the variety *attenuata* also occurs.

British distribution.—Everywhere on suitable ground throughout the kingdom; common.

Foreign localities.—Arctic seas of both hemispheres, and all European coasts as far as the Black Sea. In America it is recorded from Massachusetts by Gould (as T. fusca, *Say*), and was found very abundantly at Tadoussac, St. Lawrence, by William Brown.

* Tellina tenuis, *Da Costa.*

Tellina planata, *Pennant;* Tellina polita, *Pulteney.*

Habitat.—Very common on all sandy beaches at low tide, and down to 5 or 6 fathoms.

British distribution.—Everywhere on suitable ground; very common.

Foreign localities.—Norway and Sweden (*Lovén,* and others), French coast, Spain, Portugal, and Mogador (?) (*M'Andrew*), Mediterranean, and as far as the Black Sea (*Jeff.* in Brit. Con.)

* Tellina fabula, *Gronovius.*

Tellina discors, *Pulteney;* Tellina strigilata, *Philippi.*

Habitat.—More local than Tellina tenuis, and inhabiting a rather deeper zone. I have taken this species in Rothesay and Kamesburgh Bays, Bute; Kames Bay, Cumbrae; and off the pier at Ardrishaig; in which last locality it is plentiful in about 4 fathoms, in muddy sand.

British distribution.—Nearly everywhere on suitable ground; common.

Foreign localities.—Norway and Sweden (*Malm,* and others), northern France (*De Gerville*), Spain, Portugal, and Mogador (?) (*M'Andrew*), Mediterranean (*Philippi,*and many others).

Tellina donacina, *Linné.*

Tellina trifasciata, *Pennant.*

Habitat.—In coarse sand, dead shells, and nullipore, in 8 to 30 fathoms; generally distributed in the Clyde district, but not common. I have taken it on Bogany Point, and off Kerrycroy and Mountstuart, Bute; and on the Tan Spit, Cumbrae.

British distribution (varieties included).—Throughout

nearly all our seas, but probably not north of the Hebrides. (Forbes and Hanley give Orkney and Zetland, *fide* M'Andrew).

Foreign localities. — Spain, Portugal, and Madeira (*M'Andrew*), Mediterranean and Ægean (*Forbes*, and others).

Psammobia, *Lamarck.*

Psammobia tellinella, *Lamarck.*

Psammobia florida, *Turton.*

Habitat.—In sand and nullipore, in 12 to 15 fathoms; scarce. I have taken it outside the Tan Spit and off the west side of the Little Cumbrae. Mr. Norman reports it from Lamlash Bay.

British distribution.—Local and rather scarce, but distributed over most of our coasts.

Foreign localities.—Norway (*Lovén*), Atlantic coast of France (*Des Moulins*), Spain and Portugal (*M'Andrew*).

* Psammobia Ferröensis, *Chemnitz.*

Tellina Ferröensis, *Chemnitz;* Tellina incarnata, *Pennant;* Tellina trifasciata, *Donovan.*

Habitat.—In coarse sand and gravel, from 5 to 30 fathoms; rather scarce in a living state. Dead (but perfect) shells are not uncommon. I have taken it living in Campbeltown Loch, at the Trench Point; on Bogany Point and Ascog Patch, Bute; and on the Tan Spit, Cumbrae. Mr. Norman has taken a few specimens in Lamlash Bay.

British distribution.—On all our coasts, north, south, east, and west, from 3 to 90 fathoms.

Foreign localities.—All European coasts from Norway to Spain, throughout the Mediterranean, and as far as the Sea of Marmora (*Spratt*). M'Andrew records it from the Canaries.

Family Mactridæ, *Fleming.*

Mactra, *Linné.*

* Mactra solida, *Linné.*

Trigonella gallina, *Da Costa;* Mactra vulgaris, *Chemnitz;* The variety truncata = Mactra truncata, *Montagu;* Mactra subtruncata, *Donovan* (not *Da Costa*); and Trigonella zonaria, *Da Costa.* The variety elliptica = Mactra elliptica, *Brown.*

Habitat.—The type occurs at low water at Ettrick Bay,

but is very scarce. The variety *truncata* is common at low tide in most of the sandy bays in Bute and Cumbrae; and the variety *elliptica* is by no means scarce in muddy sand and gravel in from 12 to 30 fathoms on the Ascog shore, Bute; outside the Tan Spit, Cumbrae; and off Otter Spit, Loch Fyne.

British distribution.—Nearly everywhere; the variety *elliptica* ranging from 10 to 100 fathoms, whilst the type and variety *truncata* are littoral, or nearly so.

Foreign localities (type).—Iceland (*Verkrüzen*), Holland (*Herklots*), Spain (*M'Andrew*), Mediterranean and Adriatic (*Danilo*, and others). The variety *elliptica* ranges from Iceland (*Verkrüzen*) to northern Spain (*M'Andrew*).

* Mactra subtruncata, *Da Costa.*

Trigonella subtruncata, *Da Costa;* Mactra deltoides, *Lamarck;* Mactra stultorum, *Pennant* (not *Linné*).

Habitat.—Exceedingly abundant a little above low water in Ettrick and St. Ninian's Bays, Bute; and in Fintry Bay, Cumbrae. It is common also all along the Ayrshire coast, and in most sandy bays throughout the district. In Cumbrae they are known as "Aikens," and are used both for food and bait. This species is a favourite dish with Purpura lapillus, whose presence in considerable numbers in such an uncongenial spot as the sandy bay of Fintry is probably caused by the abundance of these Mactræ, on which they feed. I observed that, although the "Aikens" were in thousands, two of the carnivora frequently attacked opposite sides of the same bivalve. I also noticed here a singular case of defective instinct in a Purpura, which was diligently piercing a hole in a single valve (a much worn one too) of Mactra, and had nearly completed its task when interrupted.

Dr. Landsborough says that this species goes by the name of "Mureck Baan" in the Highlands, and states that "it is probable that Mureck is the Celtic origin of the Latin Murex, the shell-fish which yielded the Tyrian dye or Imperial purple," a philological opinion which will at least satisfy Professor Blackie, if no one else. Maorach Baan simply means a white shell, and is applied indifferently to several species—including Mya arenaria.†

† *Slige*, not *Maorach*, is the word used by Ossian's heroes when they proposed a carouse in the "Hall of Shells." Fingal is often called *Righ nan slige fial*, "King of the festive shell," *slige* being a deep, big-bellied shell suitable for a demi-god's potations.

British distribution.—Everywhere throughout our seas in sandy bays; a very common shell.

Foreign localities.—From Norway (*Lovén* and others) to Spain, Portugal, Mogador, and Canaries (?) (*M'Andrew*), and throughout the Mediterranean, reaching to the Black Sea (*Middendorff*).

Lutraria, *Lamarck.*

* Lutraria elliptica, *Lamarck.*

Mactra lutraria, *Linné;* Chama magna, *Da Costa;* Concha longa, etc., *Lister;* Lutraria vulgaris, *Fleming.*

Habitat.—At lowest ebb of spring tides in soft oozy sand; gregarious and common, especially at the head of deep bays and lochs, where much soft sand and mud have accumulated. I have taken it in Rothesay, Kamesburgh, and Ettrick Bays, Bute; Fintry Bay, Cumbrae; and at the Trench Point and the Lochend, Campbeltown Loch. At all these localities fine specimens may be obtained, but only at low spring tides.

In spite of the uninviting appearance of this mollusc and the dirty ground it inhabits, the fishermen at Cumbrae (who know it by the local name of "Onion") assure me that it is excellent eating, being rich and tender. Its principal use, however, is for bait. Lister figures it, but does not record its gastronomic value.

British distribution.—Throughout our coasts wherever suitable conditions exist.

Foreign localities.—From Norway to Holland, France, Spain, Portugal, and on both sides of the western part of the Mediterranean and in the Adriatic.

Scrobicularia, *Schumacher.*

* Scrobicularia prismatica, *Montagu.*

Ligula prismatica, *Montagu;* Mya prismatica, *Turton;* Amphidesma prismatica, *Brown;* Syndosmya prismatica, *Forbes* and *Hanley.*

Habitat.—In muddy sand in 6 fathoms of water off Ardrishaig Pier, rather common. This is the only locality in which I have taken it in any number; only young shells, however, were got. A few were obtained alive at Lochgoilhead, and some single valves in Rothesay Bay. It is probably a very local species in this district.

British distribution.—Generally distributed, but usually scarce.

Foreign localities.—Widely spread from Iceland (*Verkrüzen* and others), throughout northern and western Europe; also in the Mediterranean and Ægean Seas (*Forbes*).

* Scrobicularia alba, *Wood.*

Mactra alba, *Wood;* Mactra Boysii, *Montagu;* Amphidesma album, *Fleming;* Syndosmya alba, *Forbes* and *Hanley.*

Habitat.—Gregarious in mud and ooze, in from 3 to 25 fathoms; rather a common species. I have taken it large and fine at Lochgoilhead, in 3 or 4 fathoms, between Douglas and the Loch-head piers; and at Bogany Point, Bute, in 15 to 20 fathoms; also outside Tan Spit, Cumbrae, but not so common there. It is plentiful in Loch Gilp, in 5 to 7 fathoms, at the mouth of the loch. My finest specimens are an inch broad by $\frac{11}{16}$ths long, and are from Lochgoilhead.

British distribution.—Throughout our seas everywhere; a common species.

Foreign localities.—Norway (*Lovén*), Holland (*Herklots*), Spain, Portugal, and Mogador (*M'Andrew*), Mediterranean (*Philippi* and others), Ægean (*Forbes*), Sea of Marmora (*Spratt*).

Scrobicularia piperata, *Gmelin.*

Mactra piperata, *Gmelin;* Trigonella plana, *Da Costa;* Mactra compressa, *Pulteney;* Trigonella Listeriana, *Leach;* Venus borealis, *Pennant* (not *Linné*); Tellina plana, *Donovan.*

Habitat.—I have seen one specimen in Mr. Robertson's cabinet, taken on Fairlie Sands in a fathom or two of water; but have not had the good fortune to meet with this species myself. Dr. Landsborough records it from Arran, near Corriegills; where, however, Mr. Norman sought for it in vain.

British distribution.—Local throughout the English and Irish coasts in most suitable spots. In Scotland it is recorded by Macgillivray from Aberdeen, and from St. Andrews by Dr. M'Intosh; whilst Laskey and Forbes found it in the Firth of Forth.

Foreign localities.—From Norway (*Lovén*) and Holland (*Herklots*), throughout western Europe, and the Mediterranean as far as the Adriatic.

Family Solenidæ, *Latreille.*

Solecurtus, *De Blainville.*

* Solecurtus candidus, *Renieri.*

Solen candidus, *Renieri;* Psammobia strigilata and Psammobia scopula, *Turton.*

Habitat.—In sand and nullipore, 8 to 15 fathoms, on the Tan Spit and off Little Cumbrae, east side; apparently very scarce—only dead shells obtained. Mr. Robertson has taken it alive in the above locality.

British distribution.—This species occurs very sparingly throughout our seas, and is noted from various localities in the south and south-west of England, south and east of Ireland, Skye, and Shetland. It does not occur in Alder's, M'Intosh's, or Leckenby's lists from the east coast.

Foreign localities.—Spain, Portugal, Canaries, and Madeira (*M'Andrew*). Mr. Jeffreys gives Italy and Algiers.

Solecurtus antiquatus, *Pulteney.*

Solen antiquatus, *Pulteney;* Solen cultellus, *Pennant* (not *Linné*); Chama solen, *Da Costa;* Solen coarctatus, *Gmelin;* Azor antiquatus, *Brown;* Solecurtus coarctatus, *Forbes* and *Hanley.*

Habitat.—In sand and nullipore, 15 to 20 fathoms, off Little Cumbrae, east side; two living specimens, and some valves and fragments.

British distribution.—Occurs very sparingly in many localities throughout our seas, especially on the southern and western coasts.

Foreign localities.—From Norway (*Lovén*) to the Canaries (*M'Andrew*). It has also been dredged by Nares in the Mediterranean, and by Forbes in the Ægean.

Solen, *Linné.*

Solen pellucidus, *Pennant.*

Solen pygmæus, *Lamarck.*

Habitat.—In mud mixed with sand, gravel, and stones; scarce, but generally distributed in the district, in 6 to 30 fathoms.

I have taken it alive off Bogany Point and St. Ninian's Bay, Bute; on the Tan Spit and on a bank off Shellbole Bay, Cumbrae; off the Castle and Lighthouse, Little Cumbrae; also in Loch Fyne, off Otter and Silvercraigs. Perfect spe-

cimens for the cabinet are difficult to obtain, as the shells are generally crushed and broken by the weight of other matter brought up along with them in the dredge.

British distribution.—Throughout our seas; but generally scarce. Dr. M'Intosh reports it as common in St. Andrews' Bay, and thrown ashore in large numbers after storms.

Foreign localities.—Norway and Sweden (*Lovén* and others), Brittany (*Cailliaud*), Spain, Portugal, and the Mediterranean as far as Sicily (*M'Andrew*).

Solen ensis, *Linné.*

Solen curvus, *Lister.*

Habitat.—The type, a small much curved shell, excellently figured by Donovan and Jeffreys, is rare in our firth. I have only seen a few specimens thrown up on the Ayrshire sands. The variety *magna*, figured in Forbes and Hanley's British Mollusca (plate xiv. fig. 2), is, however, very common. It is much straighter than the type, and reaches as great a size as $1\frac{1}{8}$ inches by 7 inches, whilst the type measures only about $\frac{1}{2}$ inch by $3\frac{3}{4}$ inches. This variety is exceedingly abundant in Cumbrae, at Fintry Bay and Battery Point; and is common in many of the sandy bays of Bute and Arran, and on the sands at the mouth of Campbeltown Loch.

Distribution.—According to Mr. Jeffreys, Solen ensis extends throughout all our seas, from 3 to 20 fathoms, in sandy bays; and the foreign localities include the whole western and northern coasts of Europe, the Mediterranean and Black Seas, as well as Canada and the United States (presumably the eastern coast).

Solen siliqua, *Linné.*

Habitat.—Gregarious and abundant, but somewhat local, at lowest ebb of spring tides, in many of our sandy bays. The type exists plentifully and of great size in Kames Bay, Cumbrae; and Ettrick Bay, Bute; in which localities I have taken specimens $1\frac{3}{8}$ inches long by 9 inches broad. The variety *arcuata* also occurs throughout the district; it is smaller than the type, and resembles the large variety of S. ensis. Both forms, as well as S. ensis, are highly esteemed by the residents on our western coasts, and deservedly so, as they have an exceedingly rich flavour and make a delicious stew, surpassing, in the estimation of most people, the scallop

and cockle; but their bodies, being little else than a gigantic foot, usually remain somewhat hard.

The popular name, which includes S. ensis and S. siliqua, is "Spoutfish." They are chiefly obtained in spring when very low tides prevail, and are then taken in large quantities and sold at so much per score of "casts," each "cast" being three shellfish. Much dexterity is required in snatching them from their sandy burrows with the naked hand, a novice usually leaving most of the animal behind and securing only the shell and mantle. A wooden instrument, called a "spud," is sometimes used instead of the unarmed fingers; but this is accounted *infra dig.* by the adepts.

British distribution.—Everywhere in suitable situations, *i.e.* in extensive bays and flats of clean sand.

Foreign localities.—"Behring's Straits, the north-east coast of America, Faröe Islands, and all the intermediate shores to the Ægean, including the African side of the Mediterranean" (*Jeff. Brit. Con.*).

Family Pandoridæ, *Gray.*

Lyonsia, *Turton.*

Lyonsia Norvegica, *Chemnitz.*

Mya Norvegica, *Chemnitz;* Mya nitida, *Fabricius;* Mya striata, *Montagu;* Amphidesma corbuloides, *Lamarck;* Osteodesma corbuloides, *Deshayes.*

Habitat.—In sand and nullipore, in 8 to 20 fathoms; not scarce. I have taken fine specimens on Tan Spit, Cumbrae, in about 8 fathoms, off the buoy; also on the rough bank outside the Spit, in 15 to 20 fathoms. On Bogany Point and off Craigmore, in Bute, this species is not uncommon, but not so large. My best specimen (from the Tan Spit) measures $\frac{3}{4}$ inch long by $1\frac{1}{2}$ broad. Single valves exceeding these dimensions sometimes occur.

British distribution.—Sparingly distributed over all our coasts, and somewhat local. It does not occur in Dr. M'Intosh's extensive list from St. Andrews, and is reported as scarce by Alder on the Northumberland and Durham coasts. In the western and southern waters it appears to be of more frequent occurrence.

Foreign localities.—Norway (*Lovén*), Spain, Mediterranean Sea, and Madeira (*M'Andrew*). The shell from Labrador and other North American stations, which is usually referred to the present species, is the Lyonsia arenosa of Möller.

Family Anatinidæ, *D'Orbigny.*

Thracia, *Leach.*

Thracia prætenuis, *Pulteney.*

Mya prætenuis, *Pulteney;* Mya (and Anatina) prætenuis, *Turton;* Amphidesma prætenue, *Fleming;* Ligula (and Mya) prætenuis, *Montagu;* Cochlodesma (of *Couthouy*) prætenue, *Forbes* and *Hanley.*

Habitat.—In muddy sand and gravel, in 10 to 15 fathoms; a scarce shell. I have taken one or two living examples at Ardmaleish and Bogany Points in Bute, and dead shells on the Tan Spit in Cumbrae; single valves occur sparingly throughout the district. Mr. Norman states that he has taken this species in Lamlash Bay and off Cumbrae, but very sparingly, and that it is more frequent off Largs. Mr. Robertson records it as moderately common at Cumbrae.

British distribution.—Scarce, but generally distributed throughout our seas.

Foreign localities.—"Iceland, Faröe Islands, Scandinavia, north of France, Adriatic, Naples, and Sicily" (*Jeff. Brit. Con.*); also Algeria (*Weinkauff*).

* Thracia papyracea, *Poli.*

Tellina papyracea, *Poli;* Amphidesma phaseolina, *Lamarck;* Mya declivis, *Turton;* Thracia phaseolina, *Forbes* and *Hanley.* Variety villosiuscula = Anatina villosiuscula, *Macgillivray.*

Habitat.—In sand and nullipore, in about 6 to 10 fathoms; rather scarce in a living state. I have taken it alive on Bogany Point and off Craigmore and Kerrycroy, Bute; also on the Tan Spit, Cumbrae. The variety *villosiuscula* is the prevalent form in this district, but I have not kept it separate from the type in my notes. Mr. Norman reports this variety as being fine and frequent in Lamlash Bay.

British distribution.—Although apparently scarce in the Clyde district, it is reported as rather common throughout all our seas in sandy bays, from low water to a few fathoms; the variety being equally diffused, and inhabiting a deeper zone.

Foreign localities.—Iceland (*Steenstrup*), Norway (*Lovén, Sars,* and *Jeffreys*), Spain, Portugal, and Canaries (*M'Andrew*), Mediterranean (*Nares* and others).

Thracia pubescens, *Pulteney.*

Mya pubescens, *Pulteney;* Anatina myalis, *Lamarck.*

Habitat.—Mr. Robertson has a single valve of this species, fresh and adult, taken by him in Campbeltown Loch, where, however, it may have been deposited by some far-travelled codfish—(no ships discharge ballast in that inlet). The shell appears in the lists of Mr. Smith (of Jordanhill) and the Rev. Dr. Landsborough as an inhabitant of our waters, but until Mr. Robertson's "find" no corroboration of its presence so far north had been received.

British distribution.—Very scarce, and probably confined in a living state to the Devonshire and Cornish coasts.

Foreign localities.—Atlantic coast of France (*Macé* and others), Spain, Portugal, and Canaries (*M'Andrew*)—Canaries being doubtful, and only single valves obtained—Ægean (*Forbes*).

Thracia distorta, *Montagu.*

Mya distorta, *Montagu;* Venus sinuosa, *Pennant;* Amphidesma distortum and A. truncatum, *Fleming.*

Habitat.—Amongst nullipore and dead shells, in 8 to 25 fathoms; by no means scarce, but rather local. It is common on the south end of Bute, off St. Ninian's Bay and Garroch Head; as well as on the western edge of the Tan Spit, Cumbrae. I have taken it also off Craigmore and Ascog in Bute; and Silvercraigs, Loch Fyne. The specimens were invariably free, but were nevertheless frequently much distorted.

British distribution.—Locally but widely diffused throughout our seas. It appears usually to frequent the abandoned burrows of the boring mollusca, and crevices in rocks; a habit which I have not observed in this district.

Foreign localities.—Norway (*Lovén* and others), northern and western France (*De Gerville* and others), Mediterranean (*Deshayes*).

Family Corbulidæ, *Fleming.*

Neæra, *Gray.*

Neæra abbreviata, *Forbes.*

Neæra vitrea, *Lovén.*

Habitat.—In Loch Fyne this species was taken on a muddy bottom, in about 40 fathoms, by Messrs. Barlee and

M'Andrew, and more recently by the Rev. Mr. Norman. I have not met with it, nor seen an authentic Clyde specimen.

British distribution.—Skye and Shetland are the only other localities given in *Brit. Con.*

Foreign localities.—Norway (*Sars* and others), Sweden (*Asbjörnsen*), western France (*Cailliaud*), Naples (*Acton*), Ægean (*Spratt* and *Forbes*).

Neæra costellata, *Deshayes.*

Corbula costellata, *Deshayes;* Neæra sulcata, *Lovén.*

Habitat.—Mr. Robertson has one live specimen taken by him off Little Cumbrae; this is the only individual I have seen from our firth. It is on record, however, from Loch Fyne, having been taken there by Messrs. M'Andrew, Forbes, and Barlee.

British distribution.—Apparently recorded only from the western and northern coasts of Scotland; but as its range southward is very extensive, it will doubtless be found in other parts of our seas.

Foreign localities.—Norway (*Lovén* and others), western France (*De Folin*), Spain, Portugal, and Canaries (*M'Andrew*), Mediterranean (*Jeffreys* and others), Ægean (*Forbes*).

Neæra cuspidata, *Olivi.*

Tellina cuspidata, *Olivi;* Anatina and Thracia brevirostris, *Brown;* Thracia brevirostris, *Lovén.*

Habitat.—In muddy gravel; rare. I have taken one or two live and a few dead specimens, in 13 or 14 fathoms, on Bogany Point, just opposite where the pier now stands, and in a like depth off Ascog Church, in Bute; also one live specimen and some valves at Lochgoilhead, in about 18 or 20 fathoms, three quarters of a mile below Douglas Pier. The largest of these specimens is from Bogany, and measures $\frac{9}{10}''$ broad by $\frac{6}{10}''$ long. Mr. Robertson records it from Cumbrae, Loch Ridden, and Loch Fyne; in which latter locality it has been taken frequently.

British distribution.—Apparently dispersed throughout all our seas, but always scarce.

Foreign localities.—From Greenland (*Torell*), throughout northern and western Europe, and as far as the Canaries (*M'Andrew*), Mediterranean and Adriatic (*Olivi* and others), Ægean (*Forbes*).

CORBULA, *Bruguière.*

* Corbula gibba, *Olivi.*

Tellina gibba, *Olivi;* Mya inæquivalvis, *Montagu;* Corbula nucleus, *Lamarck;* Corbula striata, *Fleming.*

Habitat.—In muddy gravel, 8 to 25 fathoms; gregarious and rather common. It is plentiful on Bogany Point and along the Craigmore and Ascog shore in Bute; and outside the Tan Spit, Cumbrae; also in Loch Fyne, off Silvercraigs. Mr. Norman has taken it in Lamlash Bay, but considers it rather scarce. The shells of these molluscs seem to give considerable trouble to such carnivorous enemies as attempt to pierce them, more than half of the specimens obtained show unfinished borings which have been abandoned in disgust at the hardness of the shell; this is, of course, no protection from haddocks and cod, which swallow the Corbulæ wholesale.

British distribution.—On all our coasts; gregarious and common, generally frequenting water of 10 to 12 fathoms.

Foreign localities.—From Norway (*Lovén* and others), throughout the western coasts of Europe and as far as Mogador and the Canaries (*M'Andrew*), Mediterranean and Ægean (*Forbes* and others), Sea of Marmora (*Spratt*).

FAMILY MYIDÆ, *Fleming.*

MYA, *Linné.*

* Mya arenaria, *Linné.*

Chama arenaria, *Da Costa.*

Habitat.—At and below low water mark of neap tides, in gravelly sand and clay; very common all round Rothesay and Kamesburgh Bays in Bute, and more or less common throughout the Clyde district. I have never found this species below low water mark of spring tides.

Our fishermen use large quantities for bait, but seldom for the table. Abroad it has a much greater economic value than with us, being eaten throughout all the northern parts of both hemispheres. "Clam bake" is a well-known dish in the north-eastern States, where, according to Gould's report on "Noxious and Valuable Animals," the supply of these Myæ is inexhaustible. At the time Gould wrote (1841) the yearly value of "clams," salted for bait for the Bank fishery, was not less than 30,000 dols.

British distribution.—Throughout our seas, but somewhat

local. More abundant and larger in the Scotch waters than farther south.

Foreign localities.—Throughout the northern seas of both hemispheres, and probably not extending farther south than 40° N. lat.

* Mya truncata, *Linné.*

Chama truncata, *Da Costa.*

Habitat.—At low tide and down to 20 fathoms or so, but only young shells (Mya ovalis, *Turton*) were obtained alive in deep water. It is very common in Rothesay Bay in sand, clay, and mud; and is largely used for bait by the fishermen there. The shells of the Myæ in this bay are usually discoloured; but in Kamesburgh Bay, where the sand is quite clean, very fine examples may be got, as also in Fintry Bay, Cumbrae. It is a common shell throughout the whole district wherever a suitable station occurs. As a rule it inhabits a lower zone than Mya arenaria.

British distribution.—Throughout all our seas and at nearly all depths; very common.

Foreign localities.—Massachusetts (*Gould*), St. Lawrence (*Dawson*), Northumberland Straits (*Whiteaves*), Puget Sound (*Carpenter*), Discovery Bay, 81° 41′ N. lat. (*Feilden*), Iceland (*Verkrüzen*), Greenland (*Scoresby*), Spitzbergen (*Eaton*), Norway (*Lovén* and others), northern and western France (*Caillaud* and others). Mr. Jeffreys gives the Adriatic as a locality for this species, on the authority of Danilo and others.

Family Saxicavidæ, *Swainson.*

Panopea, *Ménard de la Groye.*

Panopea plicata, *Montagu.*

Mytilus plicatus, *Montagu;* Sphenia cylindrica, *S. Wood.*

Habitat.—I have taken one live individual of this very rare species in muddy sand and nullipore at the mouth of Loch Gilp, but mistaking it for a variety of Saxicava rugosa the specimen was scalded with the vulgar herd, and the opportunity of observing the animal (which is unknown) was lost. Mr. Robertson has also taken a single living specimen off Largs on a muddy bottom.

Distribution.—Plymouth, Ryde, Bantry, Loch Fyne, Skye, Shetland, Moray Firth, and Stonehaven are named by Mr. Jeffreys as localities for this shell; he also gives the following foreign localities—Lofoden Islands and Bergen (*Sars*),

Dröbak (*Jeffreys*), Denmark (*Hellebak*), Gibraltar and Vigo (*M'Andrew*), Naples (*Costa*), Algiers (*Weinkauff*).

SAXICAVA, *Fleurian de Bellevue.*

* Savicava rugosa, *Linné.*

Mytilus rugosus, *Linné;* Mya byssifera, *Fabricius;* Hiatella rugosa, *Fleming.* Variety arctica = Mya arctica, *Linné,* and Hiatella arctica, *Lamarck.*

Habitat.—The type, as well as the variety, is common everywhere from a little above low tide to all depths, in the crevices of stones and rocks, the roots of large seaweeds, and the cavities or whorls of dead shells; large and fine specimens are, however, scarce. My largest measures $1\frac{6}{10}$ by $\frac{8}{10}$ of an inch, and is from Mountstuart, Bute. The varieties are endless, and have given rise to an extensive synonymy.

British distribution.—Throughout all parts of our seas; exceedingly common.

Foreign localities.—From Spitzbergen (*Eaton*) and Iceland (*Verkrüzen*), throughout northern and western Europe, and as far as Mogador and the Canaries (*M'Andrew*); also throughout the Mediterranean. In America it occupies the west coast as far south as Mazatlan (*Carpenter*), and the east as far as New Bedford, as well as the Arctic seaboard, the variety *arctica* having been found by Captain Feilden in 81° 41′ N. lat. It is said to inhabit also the Antarctic seas; and Mr. Jeffreys states that specimens from Australia cannot be distinguished from those from Greenland, except that they are smaller.

FAMILY PHOLADIDÆ, *Gray.*

Pholas, *Linné.*

* Pholas crispata, *Linné.*

Pholas bifrons, *Da Costa;* Pholas crispus, *Gmelin.*

Habitat.—Gregarious in indurated clay, at Rothesay Bay, Ardbeg Point, and Ardmaleish Point, Bute; Millport Bay, Cumbrae, near the quay; Campbeltown Loch, north side; in soft clay—Bogany shore, Bute; and Balloch Bay, Cumbrae. Mr. Norman, who reports it in loose pieces of "shale" from Lamlash Bay, makes the following remark—"It usually bores from beneath upwards, and when it has perforated the stone through to the upper side . . . it dies." This species is

local, but very abundant. The usual size is about 1 inch long by $1\frac{3}{4}$ broad in specimens from stone or hard clay, but when the matrix is soft clay large specimens may sometimes be got, my largest being $1\frac{5}{8}$ by 3 inches (barely); and Mr. Robertson has a monster from Balloch Bay, measuring about $3\frac{3}{4}$ inches broad, thus approaching the dimensions attained during the glacial epoch. American naturalists have unfortunately "resurrected" Leach's generic nickname Zirphæa for this species.

British distribution.—Common, but local, throughout the whole of Scotland and north of England and Ireland, becoming scarcer in the south. None of the Pholades are eaten in this country, but are esteemed elsewhere.

Foreign localities.—Throughout northern Europe as far south as the Atlantic coast of France (*Aucapitaine*). In America it is recorded from New Jersey (*Gould*), St. Lawrence (*Whiteaves* and others), California and Puget Sound (*Carpenter*).

Xylophaga, *Turton.*

Xylophaga dorsalis, *Turton.*

Teredo dorsalis, *Turton;* Pholas xylophaga, *Deshayes.*

Habitat.—Throughout the district; common. No piece of wood, however small, seems to escape the attacks of this destructive borer. The finest specimens I have seen were obtained by the late Major Martin from the old dockgates of Ardrossan Harbour, which were utterly destroyed by the joint attacks of Xylophaga, Teredo, and Limnoria.

British distribution.—Throughout our seas—north, south, east, and west—wherever a suitable dwelling place exists.

Foreign localities.—From Norway (*Lovén* and others), throughout Denmark, France, Spain, Portugal, the Mediterranean and Adriatic.

Family Teredinidæ, *Fleming.*

Teredo, *Sellius.*†

Teredo Norvegica, *Spengler.*

Teredo Norvegicus, *Spengler;* Teredo navalis, *Montagu* (not *Linné*).

Habitat.—Frequent throughout the district, in logs cast on shore and in the piles of quays. It is, however, seldom met with in such positions as to make its extraction easy.

† Sellius, being pre-Linnean, ought, strictly speaking, to be discarded as an authority.

British distribution.—In floating and fixed timber, on nearly all our coasts.

Foreign localities.—From Finmark to Gibraltar, and the Mediterranean as far as the Adriatic. In America it is recorded by Mr. Whiteaves from Pictou, N.S., and from the eastern U.S. in Gould, ed. Binney.

Class SOLENOCONCHIA, Lacaze-Duthiers.

Family Dentaliidæ, *H. & A. Adams.*

Siphonodentalium, *Sars.*

Siphonodentalium Lofotense, *Sars.*

Habitat.—Mr. Robertson's cabinet contains about a dozen specimens of this species taken off Cumbrae. I am not aware that anyone else has found it in our firth.

British distribution,—Apparently limited, so far as is yet known, to the northern and western seas of Scotland.

Foreign localities.—Mr. Jeffreys gives Norway (*Sars*), Gascony (*de Folin*), Naples and Sicily (*Acton* and others). Captain Spratt has dredged it in the Ægean.

Dentalium, *Linné.*

* Dentalium entalis, *Linné.*

Habitat.—Common from 6 fathoms downward in muddy sand; it is a gregarious species, and is especially plentiful in 15 or 20 fathoms off Bogany point and the west side of Cumbrae.

Foreign localities.—North America (*Mighels*), Iceland (*Verkrüzen*), Norway (*Lovén* and others), France (*Lacaze Duthiers*), Spain (*M'Andrew*), Mediterranean (*Scacchi* and others), Ægean (*Forbes*).

Class GASTEROPODA.

Order Cyclobranchiata, *Cuvier.*

Family Chitonidæ, *Guilding.*

Chiton, *Linné.*

Chiton fascicularis, *Linné.*

Chiton crinitus, *Pennant.*

Habitat.—On rough stony ground off St. Ninian's Bay, Bute, 15 fathoms; off Little Cumbrae (south end) on similar ground; and at Lochgoilhead, about half a mile below

Douglas Pier, on stones in 20 fathoms. I have only taken one or two specimens of this shell at each of the above localities. As a littoral species I have found it below stones at low tide on the Ascog shore, and Mr. Norman reports it at low water at Balloch Bay and the Allans rocks, Cumbrae; also at Lamlash, Arran.

British distribution.—Generally distributed on all our coasts, but seldom plentiful.

Foreign localities.—Norway (*Lovén*, and others), Spain, Morocco, and Canaries (*M'Andrew*), the Mediterranean and Ægean Seas (*Forbes*, and others).

* Chiton cinereus, *Linné.*

Chiton asellus, *Chemnitz.*

Habitat.—From 10 fathoms downward, on stones and shells, especially on old bivalve shells. Very common on all suitable ground throughout the district. The variety *Rissoi*, which seems to depend only on its colour (uniform pale yellowish), is not uncommon.

British distribution.—Abundant everywhere below the Laminarian zone.

Foreign localities.—Throughout northern and western Europe, from Iceland (*Torell*) to northern Spain (*M'Andrew*), and throughout the Mediterranean and Ægean Seas (*Forbes*, and others): these last are, however, somewhat doubtful. In America it occurs from Greenland (*Fabricius*) to Massachusetts (*Gould*, ed. *Binney*).

Chiton marginatus, *Pennant.*

Chiton cinereus, *Laskey* (*not Linné*), Chiton fuscatus, *Brown.*

Habitat.—On stony beaches from half-tide downward, exceedingly common throughout the whole district. I have not met with it in a lower zone than low water of spring tides.

British distribution.—Everywhere on stones between tide-marks. Very common.

Foreign localities.—Northern and western Europe, from Norway (*Sars*, and others) to Mogador (*M'Andrew*), as well as in the Mediterranean and Adriatic Seas.

* Chiton ruber, *Linné.*

Chiton lævis (of Pennant), *Lovén.*

Habitat.—On stones and dead shells in 10 to 20 fathoms

in company with Chiton cinereus, but scarce, and generally small. I have taken it outside the Tan Spit in Cumbrae, and off Moll Dhu, Loch Fyne. Mr. Norman reports it from Lamlash Bay, between Clachland Point and Holy Island, but not common.

British distribution.—Chiefly in the Laminarian zone, round nearly all our shores. It is frequent on the northern, western, and southern coasts, and on the east is reported from St. Andrews (between tide-marks) by Dr. M'Intosh; Dunbar (*Laskey*), Northumberland "at low water-mark, frequent" (*Alder*).

Foreign localities.—Throughout the Arctic and Northern Seas of both hemispheres, as far south as Denmark and the Channel in Europe, and Cape Cod in America.

Chiton lævis, *Montagu.*

Chiton achatinus, *Brown* (probably not Chiton lævis of Pennant, which=C. ruber).

Habitat.—Scarce from lowest water of spring tides at Farland Point, Cumbrae, down to 8 or 10 fathoms off Shellbole Bay. I have not noted other localities.

British distribution.—This species has been noticed at very many stations all round our coasts, but is nowhere common. The following may be recorded:—Coast of Devon (*Hanley*, and others), Isle of Man (*Forbes*), Orkney and Shetland (*M'Andrew*), Oban and Loch Long (*Barlee*), St. Andrews—rare, but large—(*M'Intosh*) Northumberland (*Alder*).

Foreign localities.—Norway (*Lovén*, and others), Spain, Portugal, and Algiers (*M'Andrew*), Mediterranean and Ægean (*Forbes*, and others).

* Chiton marmoreus, *O. Fabricius.*

Chiton punctatus, *Ström;* Chiton lævigatus, *Fleming;* Chiton fulminatus, *Couthouy.*

Habitat.—On clean stones in 5 to 7 fathoms on Toward and Bogany Points, and off Ascog and St. Ninians in Bute. On Skelmorlie Bank, off Skelmorlie, and in shallow water near the Tan Buoy, Cumbrae—the largest specimens being got off Toward Point.

British distribution.—Locally distributed on both sides of Scotland. In the east of England it has been found on the Northumberland coast by Embleton and Hanley (*Alder*, as C. lævigatus), and by Bean at Scarborough. In Ireland

it is recorded from the Northern and Eastern coasts as far south as Dublin.

Foreign localities.—Spitzbergen (*Eaton*), Iceland (*Verkrüzen*), Norway (*Lovén*). In America it occurs on the Massachusetts coast (*Gould*), and Gulf of St. Lawrence (*Whiteaves*).

ORDER PECTINIBRANCHIATA.

FAMILY PATELLIDÆ, *Guilding.*

PATELLA, *Linné.*

* Patella vulgata, *Linné.*

Patella vulgaris, *Da Costa*; the variety athletica=Patella depressa, *Pennant*, and var. cærulea=Patella cærulea, *Linné.*

Habitat.—Everywhere throughout the district on rocky and stony coasts between tide-marks; both the varieties are found on Cumbrae and Bute. The largest specimens of the type which I have taken were near the Fallen rocks, Arran, and at the base of Moll Dhu, Loch Fyne—one of them measures $2\frac{5}{8}$ inches by $2\frac{1}{4}$.

The limpet is despised as an article of food in this part of the country, but it is (as the dog-whelk and the oyster-catcher know) a well flavoured morsel. Our ancestors were wiser, and consumed them largely even down to comparatively recent years, for Allan Ramsay (or whoever wrote the lines "On the Moneth of May") includes them in the list of things seasonable in that month:

> "Connans, cockles, cruds and whey,
> Lapsters, lempets, mussels in shells."

Lister tells us that limpets were known as "Flithers" and "Pap shells" in his day.

British distribution.—Everywhere on rocks and stones between tide-marks.

Foreign localities.—From Norway (*Lovén*, and others) throughout Western Europe to Spain (*Maudrac*), and both sides of the Mediterranean to the Ægean (*Forbes*).

HELCION, *De Montfort.*

* Helcion pellucidum, *Linné.*

Patella pellucida, *Linné;* Patella cærulea, *Montagu;* the variety lævis=Patella lævis, *Pennant.*

Habitat.—On Laminariæ at lowest ebb down to a few fathoms—the larger and more solid shells are imbedded in

the thick stalks of the sea-weed, whilst the young, thin individuals are generally on the fronds and amongst the roots, but not imbedded. The variety *lævis* I have taken at Campbeltown Loch, north shore.

British distribution.—Everywhere on Laminariæ. Very common.

Foreign localities.—From Iceland (*Verkrüzen*) and Norway (*Lovén*) throughout Western Europe, and as far South as Mogador (*M'Andrew*); "Sicily (*Maravigna*)" is given in Brit. Con.

TECTURA, *Cuvier.*

Tectura testudinalis, *Müller.*

Patella testudinalis, *Müller;* Patella Clealandi, *Sowerby;* Lottia testudinalis, *Forbes;* Acmæa testudinalis, *Forbes* and *Hanley.*

Habitat.—On rocks and stones from a little above low water down to 6 or 8 fathoms; common. Especially abundant between tide marks on the east side of Ardbeg Point, Rothesay Bay, and near the new pier at Craigmore, and more or less common all round Bute, as well as throughout the district. Considerable varieties of colouring are met with, ranging from a dirty white to dull uniform brown, the standard being of course a greyish body-colour, streaked, tesselated, and blotched with brown.

British distribution.—Throughout the North and West of Scotland, and the Irish Sea as far south as Dublin Bay. On the East coast it has been found at intervals as far south as Yorkshire and the Dogger Bank (*Leckenby* and *Marshall*), but I do not know whether it is plentiful or not. This species is more at home in the northern and western portions of these islands than elsewhere; indeed, the knowledge of its existence on the eastern coasts of England is quite recent, and this has been considered a sufficient reason for coming to the conclusion that a rapid southern migration has taken place on that seaboard.

Foreign localities.—Norway and Sweden (*Lovén*, and others), Iceland (*Verkrüzen*), Greenland (*Wallich*), Labrador (*Whiteaves*), St. Lawrence (*W. Brown*), Massachusetts (*Gould*).

* Tectura virginea, *Müller.*

Patella virginea, *Müller;* Patella parva, *Da Costa;* Patella pulchella, *Forbes;* Acmæa virginea, *Forbes* and *Hanley.*

Habitat.—Very common on hard ground, adhering to

stones and shells at all depths down to 25 fathoms. I have also taken it abundantly at low tide at Farland Point, Cumbrae, but it is most at home in about 10 fathoms water.

British distribution.—Very common throughout all our seas. My largest specimen from the Clyde is only $\frac{7}{16}$ of an inch long, less than half the size of specimens from Guernsey (Jeff. Brit. Con.)

Foreign localities.—Iceland (*Torell*, and others), and from Norway throughout Western Europe to Spain and Mogador (*M'Andrew*), Açores (*Drouet*), Madeira (*Watson*), St. Helena (*Jeffreys*), Mediterranean and Ægean (*Forbes*, and others),

Tectura fulva, *Müller.*

Patella fulva, *Müller;* Patella Forbesii, *Smith;* Acmæa fulva, *Hanley;* Pilidium fulvum, *Forbes* and *Hanley;* Pilidium rubrum, *Landsborough.*

Habitat.—This species occurs on stones and dead shells, in 20 to 30 fathoms, on Bogany Point, Craigmore and Ascog shore, and off St. Ninian's Bay in Bute, outside the Tan Spit, and on the west and south sides of Little Cumbrae—scarce and seldom fine—also off Moll Dhu and Silvercraigs, Loch Fyne. Mr. Norman has taken it "in some abundance" just outside Lamlash Bay, a little to the south-east of Clachland Point.

British distribution.—Local on the western and northern coasts of Scotland, and on the east coast as far south as St. Andrews (*M'Intosh*). It is also found round the whole of Ireland.

Foreign localities.—Norway (*Lovén*, *Jeffreys*, and others).

Family Fissurellidæ, *Fleming.*

Puncturella, *R. T. Lowe.*

* Puncturella Noachina, *Linné.*

Patella Noachina, *Linné;* Patella fissurella, *Müller;* Cemoria Flemingii, *Leach;* Cemoria Noachina, *Gould;* Rimula Noachina, *Couthouy;* Rimula Flemingii, *Macgillivray;* Sipho Noachina, *Brown.*

Habitat.—On hard stony ground from 17 fathoms downward, not uncommon. I have taken it off Bogany, Ardmaleish, and Ascog, in Bute; outside Tan Spit and the Little Cumbrae; off Moll Dhu and Silvercraigs, Loch Fyne. Mr. Norman records it as not uncommon in Lamlash Bay in the same locality as Tectura fulva.

British distribution.—Chiefly in the west and north of Scotland, and occasionally on the east coast, the most southern locality that I am aware of being the Dogger Bank (*Leckenby* and *Marshall*). It is by no means scarce throughout western Scotland from the Clyde northward.

Foreign localities. — Entirely northern, extending in Europe from Sweden (*Malm*) throughout Norway (*Lovén*, &c.), Spitzbergen (*Eaton*), and Iceland (*Verkrüzen*); and in eastern America from Greenland (*Torell*) and Labrador (*Whiteaves*) to Massachusetts (*Gould*). Carpenter gives also the Sea of Okhotsk.

Emarginula, *Lamarck.*

Emarginula fissura, *Linné.*

Patella fissura, *Linné;* Emarginula reticulata, *J. Sowerby;* Emarginula Mülleri, *Forbes.*

Habitat.—Common throughout the whole district on stony and shelly ground from low tide downward—it is especially plentiful off Bogany and Toward Points. In Campbeltown Loch it is not uncommon on the beach, a little above low water mark, but the specimens in such situations are seldom large.

British distribution.—Throughout all our seas, and at all depths; rather a common shell.

Foreign localities.—From Norway (*Lovén*, and others) throughout Western Europe to Spain, Madeira, and Canaries (*M'Andrew*), as well as in the Mediterranean and Adriatic.

Emarginula crassa, *J. Sowerby.*

Habitat.—This very scarce species seems to frequent rocky and bouldery ground. I have taken one live and fine specimen at Lochgoilhead, west side, half a mile below Douglas pier, in about 12 or 14 fathoms—the ground being very rough and bouldery, making it almost impossible to work the dredge. Besides this I have only taken one specimen, dead and worn, in deep water in Rothesay Bay. Mr. Barlee is said to have taken it in Loch Long.

British distribution.—Dublin and Antrim coasts; Oban; Skye; exceedingly scarce.

Foreign localities.—Norway and Sweden are the only non-British habitats which I have noticed.

FAMILY CAPULIDÆ, *Fleming.*

CAPULUS, *De Montfort.*

Capulus Hungaricus, *Linné.*

Patella Ungarica, *Linné;* Patella pileus, &c., *Da Costa;* Pileopsis Ungarica, *Lamarck.*

Habitat.—In 3 to 12 fathoms on large stones and shells, especially on the shell of Mytilus modiolus, with whose coal-black epidermis the pure white of the present species strongly contrasts. Pink or rose-coloured specimens are sometimes met with. The best locality I know of for this species is the north side of Kamesburgh Bay, Bute, in about 3 or 4 fathoms water. It is also not scarce on Bogany Point and down the east side of Bute. It occurs off Little Cumbrae, but not plentifully. Mr. Norman reports it scarce and small at Lamlash.

British distribution.—Throughout all our seas not uncommon, but probably nowhere abundant. It is taken very large and somewhat plentifully on the southern coast of Devon.

Foreign localities.—Iceland (*Wallich*), Norway (*Lovén*, and others), Spain and Portugal (*M'Andrew*), Mediterranean, Adriatic, and Ægean (*Forbes*, and others).

FAMILY TROCHIDÆ, *D'Orbigny.*

CYCLOSTREMA, *Marryat.*

Cyclostrema nitens, *Philippi.*

Delphinula nitens, *Philippi;* Margarita pusilla, *Jeffreys;* Trochus pusillus, *Forbes* and *Hanley.*

Habitat.—In sand and nullipore in 10 to 30 fathoms; rather common, but generally dead. In a living state I have taken a few specimens on the Tan Spit and off Silvercraigs, Loch Fyne. "Common in Lamlash Bay" (*Norman*).

British distribution.—Throughout our southern, western, and northern seas, and round the whole of Ireland. It has not, so far as I know, been noticed on the east coast farther south than Aberdeenshire.

Foreign localities.—Norway (*Sars*), French Atlantic coast (*De Folin*), Mediterranean (*M'Andrew*), Ægean (*Spratt*).

Cyclostrema serpuloides, *Montagu.*

Helix serpuloides, *Montagu;* Turbo divisus, *Adams* (*?*); Rissoa divisa and Delphinoidea serpuloides, *Brown;* Skenea divisa, *Fleming.*

Habitat.—Not uncommon in nullipore and shelly sand off Shellbole Bay, Cumbrae, and probably throughout the district, but I do not think I have ever taken it alive. Mr. Norman notes it as common in that part of Lamlash Bay, Arran, known as Landsborough's Bay (probably dead shells only).

British distribution.—Throughout all our coasts from low tide to 25 fathoms (Brit. Con.)

Foreign localities.—From southern Sweden throughout western Europe, the Mediterranean, and Adriatic.

* Cyclostrema (Mölleria) costulatum, *Möller.*

Habitat.—I obtained a single specimen, dead but perfect, off Silvercraigs, Loch Fyne, in 12 fathoms; nullipore. This species occurs in our post-tertiary formations, and the shell dredged by me had quite probably been washed out of one of these deposits.

The distribution as at present known is entirely northern and Arctic; it has not been taken alive in British waters, excepting by Drs. Carpenter and Thomson, who dredged it in deepish water north of the Hebrides.

Trochus, *Linné.*

Trochus helicinus, *O. Fabricius.*

Turbo helicinus, *Fabricius;* Helix margarita, *Laskey;* Turbo margarita, *Fleming;* Margarita vulgaris, *Leach;* Margarita arctica, *Gould* (as of *Leach*).

Habitat.—At low tide and down to a few fathoms on stones and seaweeds, common throughout the Firth. It is especially abundant at Farland Point, Cumbrae, where it may be got in great numbers and of good size on the under sides of loose stones at low tide. This and the next species belong to Leach's group or sub-genus Margarita.

British distribution.—Chiefly northern, its range being from Shetland as far south as the Yorkshire coast on the east, and Dublin on the west, over all which district it is generally distributed and locally common, being perhaps most at home on the western shores of Scotland.

Foreign localities.—Northern Europe, including Norway (*Lovén*), Spitzbergen (*Eaton*), White Sea (*Middendorff*), Iceland (*Verkrüzen*); Northern America, including Greenland (*Fabricius*), Labrador, and St. Lawrence (*Dawson*, and others), Massachusetts (*Gould*). It is also recorded from Behring's Straits, Vancouver, and Sea of Okhotsk.

* Trochus Grœnlandicus, *Chemnitz.*

Margarita undulata, *Sowerby;* Turbo carneus, *Lowe;* Trochus inflatus, *Brown;* Turbo incarnatus, *Couthouy;* Trochus undulatus, *Forbes* and *Hanley.*

Habitat.—A single live specimen of this northern species was taken by Mr. Robertson off Cumbrae. This is the most southern authentic locality for this shell in a living state—its known British distribution being confined to the Shetland and Orkney Islands, and the northern and western coasts of Scotland as far south as Oban Bay (*Norman*).

Foreign localities.—From upper Norway (*M'Andrew*, and others) throughout the Arctic Seas of Europe, including the White Sea, Iceland, and the Faröe Islands; and in America it is recorded from Greenland and all the eastern coast as far south as Massachusetts (*Gould*, and others).

* Trochus magus, *Linne.*

Trochus tuberculatus, *Da Costa.*

Habitat.—On rough stony ground in 4 to 20 fathoms, local but not uncommon. The best locality I know of is on the north side of Kamesburgh Bay, Bute, in about 4 to 6 fathoms, on very rough ground, where fairly well coloured and good-sized specimens were obtained. It may also be taken in 10 to 15 fathoms on a rough bank off Shellbole Bay, Cumbrae, and off the south end of Little Cumbrae, whilst Mr. Robertson has found it abundant and fine inside the Clach rock, Millport Bay.

British distribution.—Common on the southern and western coasts of England and Scotland, and throughout the Irish seaboard. In the north it is scarcer, and has not apparently been found on the east coast, excepting in a dead state (Alder).

Foreign localities.—From southern Sweden throughout the Atlantic shores of Europe, all the Mediterranean, and as far south as the Canaries, and west to the Açores.

* Trochus tumidus, *Montagu.*

Trochus patholatus, *Dillwyn;* Trochus Racketti, *Payraudeau.*

Habitat. — On stony and shelly ground in 6 to 20 fathoms everywhere throughout the district; a common shell. My finest specimens of this pretty but common species are from Loch Fyne, off Silvercraigs.

British distribution.—Everywhere on the British and Irish coasts from a fathom or two downward; it is probably most abundant in from 10 to 15 fathoms, and is apparently more at home in western Scotland than elsewhere.

Foreign localities.—Iceland (*Verkrüzen,* and others), Norway (*Lovén,* and others), Vigo (*M'Andrew*), the Mediterranean (*Philippi,* and others), Ægean (*Forbes*).

* Trochus cinerarius, *Linné.*

Trochus littoralis, *Brown;* Trochus lineatus, *Da Costa* (but not his Turbo lineatus, which is the true Trochus lineatus *Da Costa,* and is the Trochus crassus *Pulteney.*)

Habitat.—Exceedingly abundant on stony and weedy shores from half tide down to 5 or 6 fathoms, and it is not infrequent at greater depths. Good specimens of a more conical shape than the type are obtained on the fronds of Laminariæ in 3—6 fathoms. These may perhaps be the Trochus electissima of Bean.

British distribution.—Abundant everywhere throughout our seas; one of our commonest shells.

Foreign localities.—Everywhere throughout northern and western Europe; also in the Mediterranean, Adriatic, and Black Seas. M'Andrew records it from Mogador, "frequent."

Trochus umbilicatus, *Montagu.*

Trochus umbilicalis, *Da Costa;* Trochus umbilicaris, *Pennant;* Trochus cinerarius, *Pulteney.*

Habitat.—Local but not uncommon on stony beaches at about half tide. The east side of Battery Point, Cumbrae, and the Ascog shore, Bute, are good localities for this species.

As compared with the last the present species may be said to occupy a higher and much more restricted zone, and it is not by any means so common. It may sometimes be

found living in company, but always preserving their distinctive features.

British distribution.—Southern and western coasts as far north as Skye, and all round Ireland. It has not yet been found on the eastern or north-eastern coasts in a living state.

Foreign localities.—From northern and western France to Vigo Bay (*M'Andrew*). The Gulf of Lyons (*Martin*) and Black Sea (*Middendorff*) are also given in Brit. Con.

Trochus lineatus, *Da Costa.*

Turbo lineatus, *Da Costa;* Trochus crassus, *Pulteney.*

Habitat.—Dead shells and fragments are occasionally dredged off the Battery, Cumbrae—doubtless washed out of a raised beach. Mr. Robertson has also taken it under similar conditions. There is little doubt that this species no longer exists in our Firth.

Its distribution is entirely southern, being apparently confined in British waters to the Channel Islands, and the western part of the English Channel, extending to the northward as far as Wales. In Ireland it occurs in the south and west, reaching on the western side as far north as Donegal.

Abroad it ranges from northern France (*De Gerville*) along the Atlantic coasts as far as Mogador (*M'Andrew*), and is recorded from the Gulf of Lyons and the Adriatic (*Jeffreys*).

Trochus Montacuti, *Wm. Wood.*

Trochus Montagui, *W. Wood;* Trochus striatus, *Forbes*; Montagua Danmoniensis, *Leach.*

Habitat.—On the Tan Spit, Cumbrae, and off Otter, Loch Fyne, I have taken a few dead specimens, and Mr. Norman has taken it in the former locality also dead.

British distribution.—Apparently somewhat local, but generally distributed. It is recorded from many localities in the English Channel and Irish Sea, and on the west and north of Scotland. On the east coast it has been found off Aberdeenshire and Yorkshire, as well as on the Dogger Bank (*Leckenby* and *Marshall*).

Foreign localities.—Northern France (*Macé*, and others), Spain, Portugal, and both sides of the Mediterranean as far as Sicily (*M'Andrew*).

* Trochus millegranus, *Philippi.*

Trochus Clelandi, *Wm. Wood;* Trochus Martini, *Jas. Smith;* Trochus elegans, *Jeffreys.*

Habitat.—On hard ground in 8 to 30 fathoms, but young specimens occasionally occur in shallower water. It is rather a common species, and is found throughout the whole district on suitable ground. Exceedingly fine specimens were obtained on Bogany Point, Bute; and off Silvercraigs, Loch Fyne, where it is plentiful. It is also more or less common on the Ascog and Craigmore shore, in Bute; and in Cumbrae, off Shellbole Bay.

British distribution.—Abundant on the western coast of Scotland, and more or less common on all our western shores, extending as far south as the Channel Islands, becoming scarcer and smaller in the more southern localities. On the east coast the only locality I have noted is the Northumberland coast, whence two or three specimens are reported by Mr. Alder, and where Messrs. Brady and Robertson report it as common. It occurs throughout the whole of Ireland.

Foreign localities.—From Norway and Sweden (*Lovén*, and others) to Spain and Portugal (*M'Andrew*), the Mediterranean (*Nares*, and others), Ægean and Sea of Marmora (*Forbes* and *Spratt*).

* Trochus zizyphinus, *Linné.*

Trochus conuloides, *Lamarck;* Trochus Cranchianus, *Leach.*

Habitat.—From low water on stony beaches and rocky ledges down to 10 fathoms, not an uncommon species in this district. Between tide marks I have taken it on west side of Battery Point, Cumbrae, and with the dredge off Shellbole Bay; also at Bogany and Craigmore, Bute; and off Moll Dhu, Loch Fyne. Except var. *humilior*, I have not noticed any of the varieties.

British distribution.—Everywhere and generally common. It occurs in all the lists I have examined.

Foreign localities.—Everywhere from upper Norway throughout western Europe to Mogador, Madeira, and Canaries, as well as in the Mediterranean and Ægean Seas.

FAMILY LITTORINIDÆ, *Gray.*

LACUNA, *Turton.*

* Lacuna divaricata, *O. Fabricius.*

Trochus divaricatus, *Fabricius;* Turbo vinctus, *Montagu;* Lacuna vincta, *Turton;* Lacuna pertusa, *Conrad;* Lacuna cornea, L. striata and L. bifasciata, *Brown.*

Habitat.—On rocky coasts adhering to Laminariæ and Fuci at low tide, and down to a few fathoms. It is dispersed over the whole district, but I have found it more abundant at Farland Point, Cumbrae, than elsewhere.

British distribution.—Common throughout all our seas.

Foreign localities.—All the northern seas of Europe from Iceland (*Verkrüzen*) and Norway (*Lovén*) to the Bay of Biscay. In America it occurs from Greenland to Massachusetts (*Gould*).

* Lacuna puteolus, *Turton.*

Turbo puteolus, *Turton;* Cochlea parva, *Da Costa;* Helix lacuna, *Montagu;* Lacuna Montacuti, *Turton.*

Habitat.—At Farland Point, Cumbrae, amongst sea weeds at low tide, very scarce. Mr. Norman records it as plentiful on the Allans Rocks in Millport Bay.

British Distribution.—Local on many parts of our coasts. from the Channel Islands to Shetland, but more common in the southern waters than in the north.

Foreign Localities.—From Norway (*Lovén*) throughout all the western shores of Europe, as far as Vigo Bay (*M'Andrew*).

* Lacuna pallidula, *Da Costa.*

Nerita pallidulus, *Da Costa.*

Habitat.—On Fuci and other sea weeds at low water and a little above it, local and generally rather scarce. I have taken it in greatest number at Farland Point, Cumbrae, and it is also somewhat plentiful at Silvercraigs, Loch Fyne. Specimens are generally of a pale straw yellow, but a green variety is nearly equally common, both living together. They do not keep their colours, however, in the cabinet.

British distribution.—Throughout all our seas, but chiefly on the southern and western coasts, somewhat local but not uncommon. Alder and others have found it on the Northumberland, Durham, and Yorkshire coasts; Laskey at Dunbar; M'Intosh at St. Andrews; Macgillivray on the Aberdeenshire coast, and Forbes in Orkney.

Foreign localities.—Iceland and Spitzbergen to Norway and western Europe as far south as the Bay of Biscay. In America it is on record from Massachusetts as Lacuna neritoidea (*Gould*), which (fide *Jeffreys*) is our species.

LITTORINA, *Férussac.*

* Littorina obtusata, *Linné.*

Turbo obtusatus, *Linné;* Turbo neritoides, *Pulteney* (not *Linné*); Turbo retusus, *Lamarck;* Littorina littoralis, *Forbes* and *Hanley.*

Habitat.—From half-tide down to low water, exceedingly abundant on all stony beaches, and on the Fuci which cover rocky coasts, especially on Fucus serratus and F. vesiculosus.

The colourings are very varied, plain orange yellow and olive green being the rule; but these are frequently diversified by bands and tesselated markings of various shades of brown and red.

British distribution.—On all our coasts; very common.

Foreign localities.—The following are given (with certainty) in Brit. Con.:—Iceland, Faröes, White Sea, Scandinavia, Heligoland, Holland, France, Spain, Açores, Malaga, Corsica; whilst various other Mediterranean and Adriatic localities are given with doubt.

Littorina neritoides, *Linné.*

Turbo neritoides, *Linné;* Turbo petræus, *Montagu;* Turbo cœrulescens, *Lamarck;* Littorina petræa, *Brown.*

Habitat.—Mr. Norman records this species as abundant on the Outer Allans, Millport Bay, and not uncommon elsewhere in the Firth, and it is here included on his authority alone. Mr. Robertson has not met with it, nor have I, although I have made diligent search. It is a local species, and dwells on rocks above high water mark.

British distribution.—Locally abundant on most of our coasts from the Channel Islands to Shetland.

Foreign localities.—From Norway (*Lovén*), throughout Western Europe, and as far as the Canary Islands. It frequents both sides of the Mediterranean, the Ægean, and Black Sea.

* Littorina rudis, *Maton.*

Turbo rudis, *Maton;* Nerita littorea, *Fabricius* (probably); Littorina Grœnlandica, *Menke.*

Habitat.—Abundant between tide marks throughout the Clyde district. In winter and early spring they congre-

gate, along with the following species, in coteries of considerable size. The varieties *saxatilis*, *jugosa*, and *tenebrosa* also occur more or less commonly.

British distribution.—Throughout our coasts very common. The finest specimens I have taken were got at Shoreham.

Foreign localities.—From Iceland (*Verkrüzen*) and Spitzbergen (*Torell*), throughout Northern and Western Europe as far as Spain (*M'Andrew*). In America it is found in Greenland, Labrador, the St. Lawrence, and south as far as Rhode Island (*Gould*). The following localities are also given in Brit. Con.:—Mediterranean, Adriatic, and Black Sea, Açores, Mexico, Vancouver, Northern Japan, and (perhaps) the Sea of Okhotsk.

* Littorina littorea, *Linné*.†

Turbo littoreus, *Linné;* Cochlea fusca, &c., *Lister;* Turbo ustulatus, *Lamarck;* Littorina vulgaris, *Sowerby.*

Habitat.—Very abundant below high water mark of neap tides down to low tide, and occasionally in the Laminarian zone. It frequents stony and rocky beaches, living among Fuci. The predominating colour in this district is blueish black; dirty brown is not uncommon, and bright orange red is sometimes met with. Of this last I have taken three examples in Rothesay Bay and North Bute. This whelk is largely collected for the market, the best locality for this purpose being the rugged coast of Kilbrennan Sound, whence, for a number of years, considerable quantities were shipped to England. The present species is generally eaten by the lower classes in the West of Scotland, to the exclusion of the large Fusi and Buccina, which are so much prized in England. Lister tells us that the Scarborough fishermen called them "couvins." Here it is known as the whelk or wilk, winkle or periwinkle.

British distribution.—On all stony, rocky, and weedy beaches; very common.

Foreign localities.—Western Europe, from Norway to Spain and Portugal (*M'Andrew*). The Mediterranean and Adriatic localities, given by Dr. Grube and others, are perhaps doubtful. Mörch records it from Greenland, Whiteaves from Gulf of St. Lawrence, and Stimpson from Maine.

† Spelling "litus" or "littus," and its derivatives, seems to be optional; but when the genus is written "Littorina," the same spelling must necessarily be applied to the specific name "littorea."

RISSOA, *Fréminville.*

* Rissoa striatula, *Montagu.*

Turbo striatulus, *Montagu;* Turbo carinatus, *Da Costa;* Cingula striatula, *Fleming;* Littorina striatula, *Brown;* Persephona brevis, *Leach.*

Habitat.—I obtained a single dead shell and some fragments off Silvercraigs, Loch Fyne, in about 12 fathoms, nullipore and sand. Mr. Robertson has a specimen from St. Ninian's Bay, Bute; and Mr. Norman has obtained it in shell sand from Lamlash Bay. This is the most northern locality on record for this rare shell, but I suspect that all the Clyde specimens were dead, and may have been washed out of some glacial bed.

British distribution.—Entirely southern. It is on record from the Channel Islands, the northern coasts of Devon and Cornwall, Weymouth, Margate; also from Bantry Bay and Arran Islands, in Ireland.

Foreign localities.—Sweden (*Malm*), dead shells only; Western France (*Caillaud*), Northern and Southern Spain (*M'Andrew*), and throughout the Mediterranean.

* Rissoa reticulata, *Montagu.*

Turbo reticulatus, *Montagu;* Cingula Beanii, *Hanley;* Rissoa Beanii, *Forbes* and *Hanley.*

Habitat.—Dead shells are common in the Coralline zone throughout most of the district, but living specimens are very scarce. I have only noted three live individuals from off "The Hawk," Little Cumbrae; and Silvercraigs, Loch Fyne. Mr. Robertson records it as common off Cumbrae and Bute; most of his specimens, however, are dead shells. Mr. Norman finds it at Lamlash Bay, but very rare in a living state.

British distribution.—Throughout our western and northern seas; said to be not uncommon. It is probably more at home on our northern coasts than elsewhere.

Foreign localities.—Norway and Sweden (*Lovén* and others), Holland (*Malm*), Atlantic coasts of France and Spain (*M'Andrew*), the Mediterranean, Adriatic, and Ægean (*Forbes*).

Rissoa punctura, *Montagu.*

Turbo punctura, *Montagu;* Rissoa approxima, *Brown.*

Habitat.—Dead shells are very common in the Coralline zone, but it is rather a scarce species in a living state. I

have taken it alive on the Tan Spit, Cumbrae, in about 10 fathoms. Mr. Norman found it living in rock pools on the Allans Rocks, Millport Bay, and abundant in a dead state in dredged sand at Lamlash.

British distribution.—Throughout our seas, but probably not common in the sense of abundant.

Foreign localities.—Norway and Sweden (*Lovén, Sars, M'Andrew*, and others), Western France, the Mediterranean and Ægean (*various collectors*), Canary Islands (*M'Andrew*).

Rissoa abyssicola, *Forbes.*

Habitat.—Professor Forbes, the discoverer of this species, first obtained it from 100 fathoms in Loch Fyne, on a muddy bottom. Since then it has been recorded from the same inlet by Mr. Norman and others. I have not been so fortunate as to obtain it.

British distribution.—The following stations are recorded in Brit. Con.:—Skye and Hebrides, Shetland, Mizen Head, Co. Cork.

Foreign localities.—Norway (*Sars* and others), Western France (*De Folin*), Northern and Southern Spain (*M'Andrew*), Mediterranean (*Nares* and *Spratt*).

Rissoa Zetlandica, *Montagu.*

Turbo Zetlandicus, *Montagu;* Rissoa obtusa, *Brown;* Cyclostrema Zetlandica, *Fleming.*

Habitat.—Dead shells and fragments outside Tan Spit, in 15 to 30 fathoms, on sandy mud, and in 20 fathoms off Silvercraigs, Loch Fyne; but only two or three specimens were got at each locality, and all dead. Dr. Landsborough includes it in his list from Lamlash.

British distribution.—Scarce, and generally (or always?) dead. Mr. Jeffreys gives as localities Guernsey, Cornwall, Antrim, Skye, Hebrides, Orkney, Shetland, Caithness, Peterhead, Aberdeenshire. The animal appears to be unknown.

Foreign localities.—Norway (*Jeffreys*), Sweden (*Malm*), French coast (*Récluz*), Spain (*M'Andrew*), Mediterranean Sea, both sides (*Philippi, Nares, Weinkauff*, and others).

* Rissoa costata, *Adams.*

Turbo costatus, *Adams;* Rissoa exigua, *Michaud;* Turbo lacteus, *Donovan* (doubtful). It is not the Rissoa costata of Desmarets.

Habitat.—In dredged sand received from Lamlash Bay,

Arran, a few dead shells were obtained. Mr. Norman has taken it, also dead, in same locality.

British distribution.—Rather common in the south of England, and especially so in the Channel Islands, from low water down to the Coralline zone. It has been taken round all the Irish coasts, and in Scotland as far as Orkney and Shetland. On the east coast the only localities I have noticed are Northumberland (*Alder*), and Dunbar (*Laskey*).

Foreign localities.—From Norway and Sweden, throughout Western Europe, and as far as the Canaries (*M'Andrew*). It inhabits both sides of the Mediterranean and the Adriatic.

* Rissoa parva, *Da Costa.*

Turbo parvus, *Da Costa;* Cingula alba, ? *Fleming;* Rissoa fuscata, ? *Brown;* Rissoa pulchella, *Forbes;* Persephona Scotica, *Leach;* Rissoa tristriata, *Macgillivray.*
The variety interrupta = Turbo interruptus, *Adams.*

Habitat.—Swarming in rock pools on the south and south-west shores of Cumbrae, and more or less common in like localities throughout the district. The variety *interrupta* is also common, and lives in company with the type.

British distribution.—Everywhere; exceedingly common.

Foreign localities.—From Norway to the Canaries, and throughout the Mediterranean.

* Rissoa inconspicua, *Alder.*

Turbo albulus, *Maton* and *Rackett;* Rissoa maculata and R. similis, *Brown.*

Habitat.—In the Coralline zone throughout our Firth, but scarce and generally dead. Mr. Norman found it alive on decaying Laminariæ and in rock pools in Lamlash Bay.

British distribution.—On all our coasts from the Laminarian zone downward.

Foreign localities.—From Norway (*Sars*), throughout Western Europe to the Mediterranean, and as far east as the Ægean Sea (*Spratt*). It is recorded (doubtfully) by M'Andrew from the Canaries.

* Rissoa membranacea, *Adams.*

Turbo membranaceus, *Adams;* Turbo labiosus, *Montagu;* Cingula labiosa, *Fleming;* Rissoa oblonga, and R. ventricosa, *Desmarets;* Rissoa labiosa, *Forbes* and *Hanley.*
The variety elata=Rissoa elata, *Philippi.*

Habitat.—In the Laminarian zone at Farland Point, Cumbrae; not uncommon. Mr. Robertson has taken the

variety *elata* at Cumbrae plentifully, but I have not met with it. Mr. Norman has the type from Kames Bay, Cumbrae; and the variety from Lamlash Bay, Arran.

British distribution.—Throughout most parts of our coasts; rather common.

Foreign localities.—Norway (*Lovén* and others), northern and southern Spain and Portugal (*M'Andrew*), the Mediterranean, Adriatic, Ægean, and Black Seas (*various collectors*), Canaries (*M'Andrew*).

* Rissoa violacea, *Desmarets.*

Alvania rufilabrum, *Leach;* Rissoa rufilabrum, *Forbes* and *Hanley.*

Habitat.—Not uncommon at Cumbrae, off the Battery, in a few fathoms. I have taken it also on Bogany Point, Bute; and off Silvercraigs, Loch Fyne; but have not found it at all plentiful anywhere. Mr. Norman, however, states that it is abundant on Zostera in a rock pool on the Allans Rocks, Millport Bay.

British distribution.—Widely diffused, but perhaps somewhat local. It is on record from the south of England and Channel Islands, all round Ireland, and the west of Scotland, as far north as Shetland.

Foreign localities.—From Norway to Spain, the Mediterranean, Adriatic, and Ægean Seas.

* Rissoa striata, *Adams.*

Turbo striatus, *Adams;* Turbo semicostatus, *Montagu;* Cingula striata and C. semicostata, *Fleming;* Rissoa gracilis, *Macgillivray;* Pyramis candidus and P. discors, and Rissoa semicostata and R. decussata, *Brown;* Rissoa minutissima, *Michaud.* The variety arctica = Rissoa arctica, *Lovén.*

Habitat.—Exceedingly abundant at Farland and Battery Points, Cumbrae, and common throughout the district, living at and near low water mark on the under sides of stones, and amongst the roots of Laminariæ. Of the variety *arctica*, dead shells are common down to all depths.

British distribution.—Common on stony and weedy beaches everywhere throughout our islands.

Foreign localities.—Iceland (*Verkrüzen*), Spitzbergen (*Torell*), Norway (*Lovén* and others), Holland and France to northern Spain (*M'Andrew*), throughout the Mediterranean to the Ægean (*Forbes*), Madeira and Teneriffe

(*M'Andrew*). In America it ranges from Greenland (*Möller*) to Massachusetts (*Gould*), as Cingula aculeus, fide *Jeffreys*. The Scandinavian, American, and Arctic localities are referable to the variety *arctica*; the type is more southern.

Rissoa fulgida, *Adams*.

Helix fulgidus, *Adams*; Turbo fulgidus, *Montagu*; Cingula fulgida, *Hanley*; Rissoa pygmæa, *Michaud*.

Habitat.—A few living and, more numerous, dead specimens were obtained in the Coralline zone on south and west sides of Cumbrae. Mr. Norman records it as scarce in Lamlash Bay, Arran; and Kames Bay, Cumbrae. It is, however, a difficult species, and the specimens here referred to it may be regarded with a certain amount of suspicion.

British distribution.—Very common on the southern coasts of England and Ireland. The Clyde is the most northern locality which I have noticed.

Foreign localities.—Western France and Spain, and throughout the Mediterranean Sea. M'Andrew records it from the Canaries.

* Rissoa soluta, *Philippi*.

Habitat.—In 8 to 20 fathoms sand and nullipore, on the Tan Spit and west side of Cumbrae; local, but not very uncommon. Mr. Norman and Dr. Landsborough have taken it in Lamlash Bay.

British distribution.—In deepish water on most of our southern, western, and northern coasts. The only east coast localities which I have noticed are St. Andrews (*M'Intosh*), and Durham coast (*Brady* and *Robertson*).

Foreign localities.—Norway (*Sars*), French Atlantic coasts (*De Folin* and *Jeffreys*), Mediterranean, Adriatic, and Ægean Seas (*Spratt* and others).

Rissoa cingillus, *Montagu*.

Turbo cingillus, *Montagu*; Turbo vittatus, *Donovan*; Cingula cingilla, *Fleming*; Rissoa graphica and Pyramis cingillus, *Brown*.

Habitat.—Gregarious, and very abundant on the under side of stones at about half tide all round the south end of Cumbrae, and not uncommon generally throughout the district on stony beaches.

British distribution.—Locally abundant throughout our coasts wherever the ground is suitable.

Foreign localities.—From Norway throughout Western Europe, the Mediterranean and Ægean Seas; also, at Madeira (*Watson*).

HYDROBIA, *Hartmann.*

* Hydrobia ulvæ, *Pennant.*

Turbo ulvæ, *Pennant;* Cingula ulvæ, *Fleming;* Paludina ulvæ, *Forbes;* Rissoa ulvæ, *Forbes* and *Hanley;* Rissoa rubra, *Macgillivray.*

Habitat.—On the muddy shores of the Clyde about Port-Glasgow; also, but scarce, in some small pools near Farland Point, Cumbrae, and in brackish water ditches at the head of Loch Long, Loch Gilp, and other similar situations. Mr. Norman records a truncated variety from the salt water marsh at Brodick Bay, Arran.

British distribution.—In most estuaries, and brackish water pools and marshes, being specially abundant on mud flats.

Foreign localities.—From Norway (*Jeffreys* and others) to Spain (*M'Andrew*), and throughout the Mediterranean and Adriatic Seas. Carpenter records it from California, but this and other American localities are probably erroneous.

FAMILY HETEROPHROSYNIDÆ, *Clark.*

JEFFREYSIA, *Alder.*

Jeffreysia diaphana, *Alder.*

Rissoa diaphana, *Alder;* Rissoa glabra, *Brown.*

Habitat.—At Battery Point, Cumbrae, I obtained a few specimens of this shell amongst small seaweeds at low water. Mr. Norman records it as common in a pool on the Outer Allans in Millport Bay.

British distribution.—Local, but not uncommon on many parts of our coasts from Shetland to the Channel Islands, and round the whole of Ireland.

Foreign Localities.—Mr. Jeffreys gives Cherbourg and Spezzia, to which I can add nothing.

Jeffreysia opalina, *Jeffreys.*

Rissoa opalina, *Jeffreys.*

Habitat.—Somewhat common in the Laminarian zone off Shellbole Bay, Cumbrae, and in company with the preced-

ing species at Battery Point. Mr. Norman has taken it plentifully, but of small size, at the Outer Allans, Millport.

British distribution.—From Shetland to the Channel Islands; a local species, but abundant were found.

Foreign localities.—Lerici and Nice are given by Mr. Jeffreys. I have not noticed it in any of the lists which I have examined.

Family Skeneidæ, *Clark.*

Skenea, *Fleming.*

* Skenea planorbis, *O. Fabricius.*

Turbo planorbis, *Fabricius;* Helix depressa, *Montagu;* Turbo depressus, *Maton* and *Rackett;* Skenea depressa, *Fleming;* Delphinoidea depressa, *Brown.*

Habitat.—In rock pools between tide marks, on small seaweeds, and under stones. Exceedingly abundant at Cumbrae, and very common throughout the whole district.

British distribution.—On all our coasts on stony and rocky shores; very common.

Foreign localities. — Iceland (*Verkrüzen* and others), Spitzbergen (*Torell*), Norway and Sweden (*Lovén* and others), France (*Macé*), Mediterranean (*Jeffreys* and others), Madeira (*Watson*). In America it extends from Greenland (*Fabricius*) to Massachusetts (*Gould*) as S. serpuloides.

Homalogyra, *Jeffreys.*

* Homalogyra atomus, *Philippi.*

Truncatella atomus, *Philippi;* Helix nitidissima ? *Adams;* Skenea nitidissima, *Forbes* and *Hanley.*

Habitat.—Under stones at the lowest verge of spring tides and on seaweed and Zostera down to a few feet below that mark. It is probably a very common species, but the only localities I have noted are Farland and Battery Points, in Cumbrae.

British distribution.—From Shetland to the Channel Islands nearly everywhere, and generally abundant.

Foreign localities.—From Norway throughout all the western coasts of Europe, and on both sides of the Mediterranean.

Homalogyra rota, *Forbes* and *Hanley.*

Skenea rota, *Forbes* and *Hanley.*

Habitat.—Mr. Robertson has taken this species in 6 or 8

feet of water on the north side of the rock on which the Castle of Little Cumbrae stands; I have not been so fortunate, never having seen the species alive. Mr. Norman records it as rare in Lamlash Bay.

This tiny shell fully merits the admiration lavished upon it by Mr. Jeffreys. It is, indeed, one of our daintiest samples of Nature's handiwork.

British distribution.—From the numerous stations on record, it seems to be spread over all our coasts from Lerwick to the Channel Islands.

Foreign localities.—In Brit. Con. the following are given:—Bohuslän (*Malm*), Gulf of Lyons (*Martin*) Spezzia (*Jeffreys*), Sardinia and the Mediterranean shores of Africa (*Costa*), Madeira (*Watson*). Dr. Wallich dredged it in the North Atlantic in 1,622 fathoms water.

Family Vermetidæ, *D'Orbigny.*

Cæcum, *Fleming.*

Cæcum trachea, *Montagu.*

Dentalium trachea, *Montagu;* Dentalium imperforatum, *Adams;* Brochus trachiformis, and B. striatus, *Brown.*

Habitat.—Kames and Fintry Bays, Cumbrae; off Ascog, Bute; Lamlash Bay, Arran; and off Silvercraigs, Lochfyne; in 10 or 15 fathoms in sand and nullipore, mixed with mud; scarce, and generally dead. (I have never taken it alive.)

British distribution.—South and west of England and Ireland, and extending as far north as the Clyde. On the east coast Mr. Alder reports a single specimen from Tynemouth.

Foreign localities.—Brittany (*Caillaud*), Northern Spain and Canaries (*M'Andrew*), Madeira (*Watson*), throughout the Mediterranean Sea (*Nares* and others).

Cæcum glabrum, *Montagu.*

Dentalium glabrum, *Montagu;* Brochus glabrus and B. lævis, *Brown.*

Habitat.—Not uncommon alive in 4 to 15 fathoms in sand and nullipore, in company with the foregoing species, but much commoner and extending to shallower water. Mr. Norman has taken it alive in rock pools on the Allans Rocks, Millport Bay; and at Clachland Point, Arran.

British distribution.—Throughout all our coasts rather common.

Foreign localities.—From Norway to Spain and the Canary Islands, and in the Mediterranean and Adriatic Seas.

Family Turritellidæ, *Clark.*

Turritella, *Lamarck.*

* Turritella terebra, *Linné.*

Turbo terebra, *Linné;* Strombiformis terebra, *Da Costa;* Turritella communis, *Forbes* and *Hanley.*

Habitat.—Common throughout our district in mud and sandy mud from 3 to 4 fathoms downward. It is specially abundant in Rothesay Bay, where it is found inhabiting thick tenacious mud, in company with Bryssus lyrifer, Ophiocoma filiformis, Fusus gracilis, and the other few species characteristic of such unpromising deposit.

The variety *nivea* is not uncommon in company with the type, but preferring a rather cleaner bottom than the mud above referred to.

British distribution.—Throughout nearly all our seas; gregariously abundant.

Foreign localities.—From Norway (*Jeffreys* and others) to the Mediterranean and Sea of Marmora (*Spratt* and others). M'Andrew records it from Mogador.

Family Scalariidæ, *Broderip.*

Scalaria, *Lamarck.*

Scalaria Turtonæ, *Turton,*

Turbo Turtonis, *Turton;* Scalaria Turtoni, *Fleming;* Scalaria tenuicostata, *Michaud;* Scalaria planicosta, *Bivona;* Scalaria Turtonis, *Forbes* and *Hanley.*

Habitat.—In the Coralline zone, off Bogany Point, and Ascog, in Bute; and off the west coast of Cumbrae. All my specimens were dead, but Mr. Robertson has taken one or two live individuals off Cumbrae, and Mr. Norman reports a single example between Corriegills and Clachland Point, Arran. It is evidently a scarce species.

British distribution.—Sparingly found in many parts of our seas, but it does not seem to extend farther north than Aberdeenshire (*Macgillivray*). The following localities may be noted:—Whitburn (*Abbes*), Scarborough (*Bean*), Dogger Bank (*Leckenby* and *Marshall*), Guernsey (*Lukis*), Devon and Cornwall, Wales, Dublin Bay, Bantry Bay, and at Arran, West of Ireland.

Foreign localities.—From Norway to Madeira, and throughout the Mediterranean, Adriatic, and Ægean Seas.

Scalaria communis, *Lamarck.*

Turbo clathrus, *Linné* (part); Strombiformis clathratus, *Da Costa;* Cochlea variegata, *Lister.*

Habitat.—Mr. Norman obtained two or three specimens from the fishermen at Lamlash, said to have been dredged in the bay. Dr. Landsborough records it from the same locality, and Mr. Hennedy reports having procured it at Gourock. Of this species (which is often confounded with the preceding) I have never seen even a fragment in our Firth, and cannot help regarding its presence as rather doubtful.

British Distribution.—South and west of England, and all round Ireland. Leckenby records it from the Dogger Bank, and Laskey from Dunbar.

Foreign localities.—Norway (*Lovén* and others), Spain and Portugal (*M'Andrew*), Mediterranean and Ægean (*Philippi*, *Forbes*, and others), Canary Islands (*M'Andrew* fide *Jeffreys*).

Family Pyramidellidæ, *Gray.*

Aclis, *Lovén.*

Aclis supranitida, *Searles Wood.*

Alvania supranitida, *S. Wood;* Turritella minor, *Brown.*

Habitat.—Outside the Tan Spit, in 18 fathoms, sand and nullipore. Only two dead specimens obtained.

British distribution.—On our southern and western coasts from the Channel Islands to the Hebrides, but always scarce.

Foreign localities.—Norway (*Lovén*), Sweden (*Malm* and others), French Atlantic coast (*De Folin* and others), Northern Spain, Madeira, and Canaries (*M'Andrew*), Gulf of Lyons (*Martin*), and Algiers (*Weinkauff*).

Odostomia, *Fleming.*

Odostomia nivosa, *Montagu.*

Turbo nivosus, *Montagu;* Pyramis nivosus, *Brown;* Odostomia cylindrica, *Alder;* id., *Forbes* and *Hanley.*

Habitat.—A single specimen of this shell is in Mr. Robertson's cabinet, taken at Cumbrae. Mr. Norman has

taken it in Lamlash Bay, but whether in a living state or not I do not know.

British distribution.—Throughout our coasts from Shetland to the Channel Islands.

Foreign localities.—None on record, so far as I know.

* Odostomia albella, *Lovén.*

Turbonilla albella, *Lovén ;* Odostomia rissoides var. albella, *Forbes* and *Hanley.*

Habitat.—Under stones from half tide down to low water, and occasionally amongst the roots of Laminariæ. It is not uncommon in Cumbrae, especially at Foulport and Farland Point, but appears to be somewhat local. Mr. Norman has taken it at Clachland Point, Arran.

British distribution. — Locally distributed from the Channel Islands to Shetland ; not uncommon.

Foreign localities.—Norway (*Sars* and others), Sweden and Denmark (*Malm*), Western France (*Macé* and others), Mediterranean and Adriatic (*Martens* and others).

Odostomia rissoides, *Hanley.*

Odostomia scalaris, *Macgillivray ;* Rissoa glabra, *Brown.*

Habitat.—With the preceding species at Foulport, Cumbrae, and not uncommon on most stony shores in the district.

British distribution.—On all our coasts, from half tide down to a few fathoms. There are several varieties, none of which I can venture to indicate as inhabiting the Firth of Clyde.

Foreign localities.—Norway and Sweden (*Lovén, Jeffreys,* and others), French coast (*Taslé* and others), Spain (*M'Andrew*), Spezzia (*Jeffreys*), Algiers (*Weinkauff*).

* Odostomia pallida, *Montagu.*

Turbo pallidus, *Montagu ;* Odostomia unidentata, *Fleming ;* Odostomia eulimoides, *Forbes* and *Hanley.*

Habitat.—Rather common on scallop beds in 8 to 20 fathoms, generally on the ears of Pecten maximus and opercularis, and never on ground where these pectens are not found. I have taken it off Ascog, in Bute ; on Tan Spit, and off Shellbole Bay, Cumbrae ; and off Moll

Dhu and Silvercraigs, Lochfyne. This species is found on scallops which are perfectly free from the encrusting sponge, on which it was supposed to feed; the attraction, in all likelihood, lies in the fœcal matter, as suggested by Mr. Jeffreys.

British distribution.—Throughout our seas, one of the commoner species. Mr. Jeffreys states that it is especially plentiful off Plymouth.

Foreign localities. — Norway and Sweden (*Lovén, M'Andrew,* and others), France (*Cailliaud*), Spain (*M'Andrew*), Mediterranean and Adriatic (*Jeffreys* and others), Ægean (*Spratt*).

* Odostomia conoïdea, *Brocchi.*

Turbo conoideus, *Brocchi;* Odostomia plicata, *Searles Wood;* Turbonilla plicata, *Lovén ;* Alvania Cranchiana, *Leach.*

Habitat.—In muddy sand, 15 to 40 fathoms, not uncommon, but most frequently obtained in a dead state. I have taken it outside the Tan Spit, and off Shellbole Bay, Cumbrae; also at Bogany and Ascog, Bute; and off Silvercraigs, Loch Fyne.

British distribution.—The type appears to be confined to the western and northern coasts of Scotland, and is rather a common species. The variety *australis* extends to the southern and western coasts of England. On the east coast Messrs. Leckenby and Marshall have taken the type on the Dogger Bank, and Mr. Alder catalogues under the name O. unidentata (of Montagu), a shell from Tynemouth, which his synonymy indicates as belonging to the present species.

Foreign localities.—From Hammerfest (*Sars*), throughout Western Europe, and as far as Mogador and the Canary Islands (*M'Andrew*). It extends throughout the Mediterranean to the Ægean (*Spratt* and *Forbes*).

Odostomia umbilicaris, *Malm.*

Turbonilla umbilicaris, *Malm.*

Habitat.—A single dead specimen, in 15 fathoms, outside the Tan Spit, Cumbrae, in muddy sand, mixed with dead nullipore. Mr. Barlee has taken this species in Loch Fyne.

British distribution.—Coast of Devon and Cornwall.

West of Scotland, and the Shetland Islands. A rare species.

Foreign localities.—Norway and Sweden (*Malm*), Naples (*Acton*), fide Jeffreys in Brit. Con. Supp.

Odostomia acuta, *Jeffreys.*

Habitat.—A single live individual and a few dead and worn specimens occurred outside the Tan Spit, Cumbrae, in 15-18 fathoms. It is also recorded from Loch Fyne by Mr. Barlee.

British distribution.—Sparingly throughout most of our seas from the Channel Islands to Shetland.

Foreign localities.—Norway and Sweden (*M'Andrew* and others), Western France (*Cailliaud*), Spain, Portugal, and Canaries (*M'Andrew*), Mediterranean (*Jeffreys*), Adriatic (*Brusina*).

* Odostomia unidentata, *Montagu.*

Turbo unidentatus, *Montagu.*

Habitat.—Not uncommon in muddy sand, and on scallop ground in from 10 to 20 fathoms. Distributed over the west side of Cumbrae, and north, east, and south of Bute. Mr. Norman records it from Lamlash Bay.

British distribution.—Throughout most of our coasts, from low water mark downward.

Foreign localities.—Norway (*Sars*), Sweden (*Malm*), Western France (*De Folin* and others), Madeira (*Watson*).

* Odostomia turrita, *Hanley.*

Habitat.—In rock pools, at low water, on the southern and western shores of Cumbrae, and at Ascog, Bute. A scarce shell in my experience. Mr. Norman reports it from Lamlash Bay, Arran.

British distribution.—From the Channel Islands to the Hebrides; not uncommon, but local.

Foreign localities.—Mr. Jeffreys gives the Cattegat, Brittany, Cannes, Spezzia, Dalmatia, Madeira and Teneriffe.

Odostomia insculpta, *Montagu.*

Turbo insculptus, *Montagu;* Turbonilla obliqua, *Lovén.*

Habitat.—Scarce, in 15 to 30 fathoms, in muddy sand, nullipore and dead shells. I have taken it alive outside the Tan Spit, Cumbrae; and off Silvercraigs, Loch Fyne. Dead shells are occasionally found in deep water throughout the district.

British distribution.—Throughout the south-western, western, and north-western coasts of England and Scotland; always scarce. On the east coast it has been found at Tynemouth (*Alder*), and on the Dogger Bank (*Leckenby* and *Marshall*).

Foreign localities.— Norway and Sweden (*Sars* and others), Western France (*De Folin*).

Odostomia obliqua, *Alder.*

Habitat.—With the preceding species, and equally scarce. My specimens are all dead shells, and are from Cumbrae and Ascog.

British distribution.—Chiefly in the south and west of England, and in the Channel Islands; Skye, Shetland, and Aberdeenshire are recorded in Brit. Con., and Alder obtained it at Tynemouth "rare in shell sand."

Foreign localities. — Sweden, Normandy, Naples, and Dalmatia are given in Brit. Con.

Odostomia decussata, *Montagu.*

Turbo decussatus, *Montagu;* Helix arenaria, *Maton* and *Rackett.*

Habitat. — Amongst dead shells and nullipore, in 15 fathoms, off Ascog, Bute; rare. Mr. Norman, however, found it common in a dead state in Lamlash Bay, and more rarely alive in the same locality.

British distribution. — Throughout our coasts in the Coralline zone; not uncommon.

Foreign localities.—Western coasts of France (*De Folin* and others).

Odostomia indistincta, *Montagu.*

Turbo indistinctus, *Montagu;* Turritella truncata, *Fleming;* Chemnitzia indistincta, *Forbes* and *Hanley.*

Habitat.—Amongst dead shells and nullipore, in 10 to 20 fathoms, sparingly throughout the district. Mr. Norman has found it not uncommon living in rock pools at Cumbrae, and in shell sand at Lamlash Bay.

British distribution.—Widely spread throughout our seas, but probably somewhat local.

Foreign localities.—From Norway (*Sars* and others), throughout Western Europe, and as far as the Canaries

(*M'Andrew*). Mr. Jeffreys and many others record it from the Mediterranean.

Odostomia interstincta, *Montagu.*

Turbo interstinctus, *Montagu;* Turbo canaliculatus, *Adams;* Rissoa Deshayesiana, *Récluz.*

Habitat.—From 8 fathoms downward, amongst dead shells, sand and nullipore; rather common in a living state throughout the district. Dead shells are abundant on the Tan Spit, Cumbrae. Mr. Norman has taken it alive in rock pools between tide marks.

British distribution.—Nearly everywhere on our coasts from a little below the verge of low water downward.

Foreign localities.—Throughout the Atlantic coasts from Norway to the Canary Islands, and in the Mediterranean, Adriatic, and Ægean Seas.

* Odostomia spiralis, *Montagu.*

Turbo spiralis, *Montagu;* Voluta pellucida, *Dillwyn.*

Habitat.—Living with the preceding, and equally common on the coasts of Bute and Cumbrae, and generally throughout the district Mr. Norman has taken it alive in rock pools at Cumbrae.

British distribution.—With the preceding species, in the Laminarian and Coralline zones; a common shell.

Foreign localities.—From Norway (*Sars* and others) to Sweden, Denmark, France, Spain, Portugal, and as far as Gibraltar (*M'Andrew*). The Adriatic is also given in Brit. Con. Supp.

Odostomia fenestrata, *Forbes.*

Chemnitzia fenestrata, *Forbes* and *Hanley.*

Habitat.—I have seen one specimen in Mr. Robertson's cabinet, taken off Kilchattan Bay, Bute. This appears to be the most northern locality on record, and the specimen is probably unique from our Firth.

British distribution.—Entirely southern—the localities given in Brit. Con. are Dartmouth, Southampton, Eyemouth, Torbay, Fowey, Falmouth, and Jersey.

Foreign localities.—French Atlantic coast (*Cailliaud* and others), Northern Spain (*M'Andrew*), Spezzia (*Jeffreys*), Algiers (*Weinkauff*).

Odostomia scalaris, *Philippi.*

Melania scalaris, *Philippi;* Chemnitzia scalaris, *Forbes* and *Hanley.* The variety rufescens=Chemnitzia rufescens, *Forbes;* Turritella indistincta, *Fleming;* and Turbonilla interrupta, *Totten.*

Habitat.—Alive in 18 fathoms, in muddy sand, at Loch Goilhead, about half a mile below Douglas Pier; also, in 12 fathoms nullipore, sand, and dead shells, off Silvercraigs, Loch Fyne. Dead specimens were obtained off Garroch Head, Bute; and on the Tan Spit, Cumbrae. Mr. Norman records it from Lamlash Bay, Arran. My specimens, and apparently those obtained by Mr. Norman, belong to the variety *rufescens.*

British distribution.—The type occurs in many localities on the southern and western coasts of England, and the variety is sparingly found throughout the west and north of Scotland. All the Scotch specimens which I have seen belong to the variety.

Foreign localities.—The type ranges from France throughout western Europe, the Mediterranean and Ægean; and Mr. Watson records it from Madeira. The variety is recorded from Norway (*Sars, Jeffreys,* and others), as well as from New England (*Stimpson*) and Gulf of St. Lawrence (*Whiteaves*).

Odostomia rufa, *Philippi.*

Melania rufa, *Philippi;* Turbo similimus, *Montagu* (probably); Pyramis crenatus, *Brown;* Chemnitzia rufa, *Forbes* and *Hanley.* The variety fulvocincta = Turritella fulvocincta, *Thompson,* and Chemnitzia fulvocincta, *Alder.*

Habitat.—In 5 to 30 fathoms; muddy and shelly sand and nullipore. I have taken it alive off Ascog and Craigmore in Bute; on Tan Spit, Cumbrae; and off the pier at Ardrishaig in 5 fathoms, where it is rather common. My specimens all belong to the variety; many of them are decollated.

British distribution.—The type is local and rather scarce on our southern and south-western coasts. The variety is dispersed throughout both sides of Scotland and north-east of England; it is not uncommon, but rather local.

Foreign localities.—The type (which is southern) ranges from the Channel as far as the Canaries (*M'Andrew*), and throughout the Mediterranean (*Nares,* and others). Sars, Jeffreys, and others record the variety from Norway and Sweden.

Odostomia lactea, *Linné.*

Turbo lacteus, *Linné;* Turbo elegantissimus, *Montagu;* Turbo acutus, *Donovan;* Chemnitzia elegantissima, *Forbes* and *Hanley.*

Habitat.—In 10 fathoms on the Tan Spit, Cumbrae, in muddy sand and nullipore; only dead shells obtained.

British distribution.—Scarce on the western coasts of Scotland; but Forbes and Hanley state that it is "by far the commonest of the Chemnitziæ, being met with almost all round the coasts of the United Kingdom, though most abundantly on the southern and western shores."

Foreign localities.—From Norway (*Sars*, and others), throughout western Europe and as far as Mogador and the Canaries (*M'Andrew*). It inhabits all the Mediterranean and Adriatic seas, and is recorded by Forbes from the Ægean.

Odostomia Scillæ, *Scacchi.*

Melania Scillæ, *Scacchi;* Eulimella Scillæ, *Forbes* and *Hanley;* Eulima M'Andræi, *Forbes;* Chemnitzia Macandrei, *Alder.*

Habitat.—In 15 to 25 fathoms outside the Tan Spit and off Shellbole Bay, Cumbrae; off Ascog, Bute; and Silvercraigs, Loch Fyne, in sand and nullipore. It is scarce in a living state, but dead shells and fragments are not uncommon. Mr. Norman has taken it off Tarbert, Loch Fyne.

British distribution.—Occasionally throughout the Scotch coasts, as well as on the north-eastern coast of England; but as it enjoys a considerable range southward, we may expect to find it on all our western and southern coasts. Its head-quarters in British waters are probably on the western coasts of Scotland.

Foreign localities.—Norway and Sweden (*Lovén*, and others), Brittany (*Caillaud*), Spain, Portugal, Madeira, and Canaries (*M'Andrew*); also Naples (Brit. Con. Supp.)

* Odostomia acicula, *Philippi.*

Melania acicula, *Philippi;* Eulimella acicula, *Forbes* and *Hanley;* Turbonilla producta, *Lovén.*

Habitat.—In 20 fathoms muddy sand off "The Hawk," Little Cumbrae; scarce—only three live specimens obtained. Mr. Robertson notes it from Tarbert, Loch Fyne, as well as from the Tan Spit.

British distribution.—Rare and local. It is taken on the southern coasts of Devon and Cornwall, south and west of

Ireland, and on the western and northern coasts of Scotland as far north as Shetland. On the east coast Alder catalogues it as taken at Whitburn by Messrs. Abbes and Howse; and Messrs. Leckenby and Marshall record it as one of the few members of this genus taken on the Dogger Bank.

Foreign localities.—Including its varieties this species ranges throughout northern and western Europe to the Mediterranean, Adriatic, and Ægean Seas.

Odostomia nitidissima, *Montagu.*

Turbo nitidissimus, *Montagu;* Pyramis nitidissimus, *Brown;* Aclis nitidissima, *Forbes* and *Hanley.*

Habitat.—I have seen (but was unable to verify) a single specimen in Mr. Robertson's cabinet, taken off the Horse Island, Ardrossan. Mr. Norman states that he took one example in Millport Bay, and Dr. Landsborough records it from Lamlash.

British distribution.—Throughout our seas from 5 to 30 fathoms; a very scarce shell.

Foreign localities.—Mangerfiord, Norway (*Lilljeborg*), Dröbak, Christianiafiord (*Jeffreys*), western France (*Caillaud*), Gulf of Lyons (*Martin*), Spezzia (*Jeffreys*), Adriatic (*Brusina*).

Family Eulimidæ, *H.* and *A. Adams.*

Eulima, *Risso.*

Eulima polita, *Linné.*

Turbo politus, *Linné;* Strombiformis albus, *Da Costa;* Turbo albus, *Donovan;* Phasianella polita, *Fleming;* Eulima Anglica, *Sowerby.*

Habitat.—In 8 to 25 fathoms in muddy sand, nullipore, and dead shells; rather common, but fine adult specimens are scarce. I have taken it off Craigmore, Ascog, and Garroch Head, Bute; on the Tan Spit and off Shellbole Bay, Cumbrae, where it is fine and somewhat common; and off Moll Dhu and Silvercraigs, Loch Fyne, but very sparingly. Mr. Norman reports it as rare throughout the Clyde district. My largest specimens barely measure $\frac{8}{10}$ths of an inch long, and are from Cumbrae.

British distribution.—Throughout all our seas; by no means rare.

Foreign localities.—Norway (*Sars*, and others), Spain and Portugal (*M'Andrew*), Mediterranean (*Payraudeau*, and others), Ægean (*Forbes*).

Eulima intermedia, *Cantraine.*

Eulima nitida, *Philippi.*

Habitat.—In 20 fathoms off "The Hawk," Little Cumbrae, on a bottom of muddy sand; one fine example only.

British distribution.—Mr. Jeffreys gives the following localities, to which I can add nothing:—Shetland, West of Scotland, Arran Islands (Galway), Cork, Falmouth, Plymouth, Exmouth, Channel Islands, Coquet and Berwick Bay.

Foreign localities.—Norway (*Lovén*, and others), Spain and Portugal, Madeira, and Canaries (*M'Andrew*), Mediterrannean (*Philippi, Nares*, and others), Ægean (*Forbes*).

Eulima distorta, *Deshayes.*

Melania distorta, *Philippi;* Balcis arcuata, *Leach.*

Habitat.—In muddy sand and amongst dead shells, from the Laminarian zone downward; rather common on the Tan Spit, Cumbrae, and generally throughout the district. The variety *gracilis* is frequently found, usually in deeper water than the type; but I have taken them together.

British distribution.—Throughout our seas from the Channel Islands to Shetland, from low tide to 90 fathoms. The variety is said to be confined to the quiet lochs of western Scotland.

Foreign localities.—Throughout north-western and western Europe, and as far south as the Canaries (*M'Andrew*). It also frequents the whole of the Mediterranean, Adriatic, and Ægean Seas.

Eulima bilineata, *Alder.*

Habitat.—Scarce in 20 fathoms off "The Hawk," Little Cumbrae, in muddy sand, where I dredged two live specimens and some fragments; also off Silvercraigs, Loch Fyne, one live and a few dead specimens.

British distribution.—From the Channel Islands to Shetland, but owing to E. subulata being often confounded with it the localities published are not quite reliable; the following, however, are probably trustworthy:—Northumberland and Yorkshire coasts (*Alder, Bean*, and others), Dogger Bank (*Leckenby* and *Marshall*), St. Andrews (*M'Intosh*), Channel Islands (*Hanley*), Cork Harbour, Bantry Bay, and Shetland (*Jeffreys*).

Foreign localities.—Norway (*Lovén*, and others), Sweden (*Malm*), western France (*De Folin*), Mediterranean (*Martin* and others), Adriatic (*Brusina*).

Family Naticidæ, *Swainson.*

Natica, *Adanson.*

* Natica sordida, *Philippi.*

Habitat.—Two large dead specimens at Bogany, Bute, are all that I have taken; they were occupied by hermit crabs. Mr. Robertson has two live examples from Cumbrae. Mr. Norman states that it is found in Kilbrennan Sound.

British distribution.—In rather deep water on our western, northern, and eastern coasts, and all round Ireland; by no means a common shell.

Foreign localities.—Western France (*Fischer*), Spain and Portugal (*M'Andrew*), and the Mediterranean (both sides) as far as Sicily (*Philippi*, and others).

Natica catena, *Da Costa.*

Nerita catena, *Da Costa;* Cochlea rufescens, *Lister;* Nerita glaucina, *Pennant;* Natica glaucina, *Fleming;* Natica monilifera, *Lamarck*, id. *Forbes* and *Hanley.*

Habitat.—At low water of spring tides down to one or two fathoms in extensive sandy bays; not uncommon in Fintry Bay, Cumbrae; Ettrick and St. Ninian's Bays, Bute; and on most of the Ayrshire coast.

It is a beautiful subject for the aquarium when newly taken, but soon loses its vigour. The characteristic coloured markings on this shell generally fade away shortly after the death of the animal and exposure to the air.

British distribution.—On all our coasts wherever suitable ground exists, *i.e.* an extensive sandy flat with a supply of bivalve shells.

Foreign localities.—From Norway and Sweden (*Lovén*, and others), throughout western Europe and the Mediterranean as far as the Adriatic.

* Natica Alderi, *Forbes.*

Natica nitida, *Forbes* and *Hanley.*

Habitat.—In clean sand at lowest spring tides, and in sand, sandy mud, and gravel down to all depths; exceedingly common throughout the district. The size of our Clyde shells does not approach that of specimens from more southern localities. Montagu and the other earlier writers refer this species to the preceding, believing it to be the immature state.

British distribution.—Everywhere on suitable ground very common.

Foreign localities.—Norway (*Lovén*, *Jeffreys*, and others), northern and southern Spain and Portugal (*M'Andrew*), Mediterranean (*Philippi*, and others).

* Natica Montacuti, *Forbes.*

Natica Montagui, *Forbes;* Nerita rufa, *Montagu;* Natica rufa, *Fleming;* Natica rutila, *Macgillivray.*

Habitat.—From 12 fathoms downward on muddy gravel; exceedingly common throughout the whole district, and occasionally large and fine. My largest specimen, measuring 0″.65 long by 0″.55 broad, is from Cumbrae. This species never inhabits the littoral or sub-littoral zone like the preceding.

British distribution.—Common in our northern seas, and extending south as far as the English Channel, where it becomes less plentiful. It is abundant and fine on the Dogger Bank (*Leckenby* and *Marshall*).

Foreign localities.—Iceland (*Steenstrup*), Norway and Sweden (*Lovén*, and others).

Family Solariidæ, *Chenu.*

Adeorbis, *Searles Wood.*

Adeorbis subcarinatus, *Montagu.*

Helix subcarinata, *Montagu;* Trochus rugosus, *Brown;* Cingula subcarinata, *Fleming.*

Habitat.—I have obtained a few dead specimens in the Coralline zone off Silvercraigs, Loch Fyne. Mr. Robertson has taken it off Callum's Hole, Bute; and Mr. Norman in Lamlash Bay—doubtless in a dead state.

British distribution.—Chiefly southern. It has been taken throughout the English Channel, and in the Channel Islands; on the Welsh coast, and all round Ireland. It is also reported from Aberdeen by Dawson. Live specimens are exceedingly scarce in British waters.

Foreign localities.—From the French Atlantic coast throughout Spain, Portugal, and the whole Mediterranean, Adriatic, and Ægean Seas. M'Andrew also records it from Mogador.

Family Velutinidæ, *Gray.*

Lamellaria, *Montagu.*

Lamellaria perspicua, *Linné.*

Helix perspicua, *Linné*; Bulla haliotoidea (female) and Lamellaria tentaculata (male), *Montagu.*

Habitat.—In the Laminarian and Coralline zones off Farland Point and the Tan Spit, Cumbrae; and off Silvercraigs, Loch Fyne. Mr. Norman has taken it in a rock pool at the Allans Rocks, Cumbrae: and Mr. Hennedy, at Gourock, beneath stones.

British distribution.—Generally dispersed throughout our seas; it finds a place in almost every catalogue. Besides the above genera this species has been referred to the genus Sigaretus (*Cuvier*) by Fleming, Brown, Philippi, and others; to Coriocella (*De Blainville*) by Johnston, Küster, and others. It is the Marsenia of Leach, Cryptocella of Adams, and Ermæa of J. E. Gray.

Foreign localities.—Norway (*Lovén*), Spain, Portugal, the Canaries, and Madeira (*M'Andrew*), Mediterranean and Ægean (*Forbes*, and others), Labrador (*Packard*), Massachusetts (*Gould*).

Velutina, *Fleming.*

Velutina plicatilis, *Müller.*

Bulla plicatilis, *Müller*; Bulla flexilis, *Montagu*; Sigaretus flexilis, *Brown*; Coriocella flexilis, *Macgillivray*; Velutina flexilis, *Forbes* and *Hanley.*

Habitat.—I took a single live specimen on Bogany Point, Bute, near the buoy, on stony ground in about 12 or 15 fathoms. Forbes and M'Andrew obtained one specimen in Loch Fyne, on stony ground in 25 fathoms. This is probably one of our rarest shells.

British distribution.—Rare and local. It is recorded from Dunbar (*Laskey*), Whitburn and Cullercoats (*Alder*, and others), Dunnet Bay (*Peach*), Stromness Bay, Orkney (*Forbes* and *Goodsir*), and Tresta Voe, Shetland (*Jeffreys*).

Foreign localities.—Norway (*Lovén*, and others), Iceland (*Steenstrup*), Greenland (*Mörch*). It probably ranges throughout the Arctic seas.

* Velutina lævigata, *Pennant.*

Helix lævigatum, *Pennant;* Helix lævigata, *Linné* (probably); Bulla velutina, *Müller;* Helix haliotoïdes, *Otho Fabricius;* Velutina striata, *Macgillivray.*

Habitat.—On stony and gravelly ground, in 6 to 30 fathoms; rather common, and especially so off Bogany and Toward Points. I have taken it off Ardmaleish, Bogany, Ascog, and Garroch Head, in Bute; off Fintry Bay and on the Tan Spit, Cumbrae; off Moll Dhu and Silvercraigs, Loch Fyne. Mr. Norman has taken it sparingly in Lamlash Bay, Arran; and Mr. Hennedy, at Gourock.

British distribution.—Everywhere on stony and gravelly ground throughout our coasts; a somewhat common species.

Foreign localities.—From Spitzbergen (*Eaton*), Iceland (*Verkrüzen*), and Scandinavia (*Lovén*, and others), throughout western Europe as far as northern Spain (*M'Andrew*); in the Mediterranean at Spezzia (*Jeffreys*). In America it extends from Greenland (*Fabricius*, and others) to Massachusetts (*Gould*); and Carpenter includes the North Pacific in its range.

Family Cancellariidæ, *Forbes* and *Hanley.*

Trichotropis, *Broderip* and *Sowerby.*

* Trichotropis borealis, *Broderip* and *Sowerby.*

Murex carinatus, *Laskey;* Fusus umbilicatus, *J. Smith;* Fusus Laskeyi, *Macgillivray.*

Habitat.—On hard ground from 6 fathoms downward, in company with the preceding species; rather common on suitable ground throughout the district. On Bogany Point it is perhaps more at home than elsewhere, but my finest specimens are from the rough bank outside the Tan Spit; they measure 0″.70 by 0″.45.

British distribution.—From the North Channel to Shetland on the western coast, and from the Dogger Bank northward on the east.

Foreign localities.—Norway (*Lovén*, and others), Iceland (*Verkrüzen*, and others), Greenland (*Möller*), St. Lawrence (*Dawson*, and others), Massachusetts (*Gould*). It probably inhabits the Arctic Ocean generally, and may be called a "palæocrystic" species, having been obtained by Captain Feilden at Dumb Bell Harbour (82° 30′ N. lat.), within a few miles of the farthest point hitherto reached by man.

FAMILY APORRHAÏDÆ, *Troschel.*

APORRHAÏS, *Da Costa.*

* Aporrhaïs pes-pelecani, *Linné.*

Strombus pes pelecani, *Linné;* Aporrhaïs quadrifidus, *Da Costa;* Rostellaria pes pelecani, *Lamarck;* Chenopus pes pelecani, *Philippi.*

Habitat.—In mud, gravel, and muddy sand and nullipore—in fact everywhere except on rocky ground and amongst large clean stones—from about 8 fathoms downward; very common. Truncated specimens are often met with; these are usually aged individuals. Young shells are also occasionally obtained which have the spire more or less bent. Some of the aged shells have the interior of the mouth stained a rich sea-green colour.

British distribution.—Throughout all our seas, chiefly in the Coralline zone; a common shell.

Foreign localities.—Throughout northern and western Europe, from Iceland (*Verkrüzen*) to Gibraltar (*M'Andrew*), as well as the Mediterranean, Adriatic, and Ægean Seas, and reaching to the Sea of Marmora (*Spratt*).

FAMILY CERITHIIDÆ, *Fleming.*

CERITHIUM, *Adanson.*

* Cerithium reticulatum, *Da Costa.*

Strombiformis reticulatus, *Da Costa;* Turbo punctatus (?), *Linné;* Murex scaber, *Olivi;* Murex acuminatus, *Pennant;* Murex reticulatus, *Pulteney.*

Habitat.—Below stones at low water and down to 2 or 3 fathoms in the Laminarian zone; not plentiful in my experience, but Mr. Norman states that it is "the most abundant shell in the district." Dead shells and fragments are very common down to considerable depths.

British distribution.—South and west of England, all Ireland, and western coast of Scotland as far north as the Hebrides and Orkneys; rather common, and occasionally abundant. It frequents the lower part of the Littoral and the Laminarian zones. Mr. Jeffreys has taken this species from off Scarborough in May, 1875 (*Leckenby* and *Marshall* in Annals, Dec. 1875). Except at the ballast ports I am not aware that this species, so common elsewhere, has been found on the east coast, with the above exception.

Foreign localities.—Northern, western, and southern Europe, from Norway (*Lovén*) to the Mediterranean and Sea of Marmora (*Spratt*). M'Andrew records it from Mogador, Madeira, and Canaries.

Triforis, *Deshayes.*

Triforis perversa, *Linné.*

Trochus perversus, *Linné;* Murex adversus, *Montagu;* Terebra perversa, *Fleming;* Cerithium adversum, *Forbes* and *Hanley.*

Habitat.—Dead specimens in the Coralline zone not uncommon. I have not taken it alive, but Mr. Norman states that he has found it living in rock pools; rare.

British distribution.—Chiefly on the southern and western coasts of England, and all Ireland. It occurs more or less sparingly throughout the west and north of Scotland as far as Shetland, and on the east coast it is recorded from Aberdeenshire and Dunbar.

Foreign localities.—From Norway (*Lovén*, and others) to Spain, Portugal, Mogador, Madeira, and Canaries (*M'Andrew*), as well as the Mediterranean and Ægean (*Forbes*).

Order Siphonobranchiata.

Family Cerithiopsidæ, *P. P. Carpenter.*

Cerithiopsis, *Forbes* and *Hanley.*

Cerithiopsis tubercularis, *Montagu.*

Murex tubercularis, *Montagu;* Terebra tubercularis, *Fleming;* Cerithiopsis tuberculare, *Forbes* and *Hanley.*

Habitat.—Under stones and in rock pools at Battery Point, Cumbrae; rare in a living state. Dead shells are not uncommon down to a considerable depth throughout the whole district.

British distribution.—South and west of England, all Ireland, and west of Scotland as far as the Shetland Islands. Mr. Fryer has taken a specimen on the Northumberland coast, and Captain Laskey records it from Leith; but these east coast specimens may have been brought in ballast.

Foreign localities.—From Norway and Sweden (*Lovén*, and others) to the Canaries (*M'Andrew*), and throughout the Mediterranean. In America, Gould records it (as Cerithium Greenii) taken in Dartmouth harbour by Professor Adams.

FAMILY BUCCINIDÆ, *Fleming.*

PURPURA, *Bruguière.*

* Purpura lapillus, *Linné.*

Buccinum lapillus, *Linné;* Purpura Anglicana, *Lister.*

Habitat.—On all rocky coasts and in some sandy bays (such as Fintry) where Mactrae and other bivalves abound; exceedingly common. This voracious animal seems to spend most of its time feeding, its favourite morsels being barnacles, limpets, cockles, and Mactrae. Gould endeavours to palliate the destructive habits of this mollusc, pointing out that being a dweller amongst rocks and stones only univalves can be its victims, and that the Naticæ must be held answerable for the ruined homesteads of the bivalves which bestrew our sandy bays. That this is not a true inference I have shown above and elsewhere; and it is certain that the prospect of a juicy dish entices the dog whelk to abandon the rocks and wander over sandy bays, although probably never becoming domiciled on such uncongenial ground. The usual colour in this district is yellowish white; banded specimens are not uncommon, especially in the neighbourhood of Helensburgh and Rothesay, where also banded specimens of Littorina obtusata and striped specimens of Mytilus edulis are common, suggesting a connection between sewage and decorative marking! This common shell, known with us as the dog whelk, is not of any economic value, being neither eaten nor used for bait. It yields, however, a well coloured and permanent dye, suitable for marking linen; but the invention of "the Original Bond" has put the molluscan extract out of court.

British distribution.—Everywhere throughout our shores; very abundant.

Foreign localities.—Throughout the northern seas of both hemispheres, extending in Europe as far south as Spain (*M'Andrew*), and becoming dwarfed at Mogador (*Lowe*), its southmost authentic limit. In America we have it on the eastern coast, from Greenland and Labrador to Massachusetts (*Gould*); whilst Carpenter records it from the North Pacific. Doubtful localities, such as Mexico and Senegal, are also on record.

BUCCINUM, *Linné.*

* Buccinum undatum, *Linné.*

Buccinum crassum, &c., *Lister;* Buccinum vulgare, *Da Costa;* Tritonium undatum, *Müller.*

Habitat.—Common everywhere from low water mark to

all depths, and on all sorts of ground. At Fintry Bay finely coloured and clean specimens may be had at lowest ebb—both type and the short ventricose variety *littoralis*. In 10 to 15 fathoms, in muddy gravel and nullipore, the largest specimens are usually got; 4½ inches is the maximum length which I have seen attained by the type. This shellfish is seldom eaten in our district, but is appreciated in the large towns in England, where it is hawked, ready boiled, on the streets.

British distribution.—Everywhere from low water to all depths; very common.

Foreign localities.—Northern and western Europe, from Iceland (*Verkrüzen*, and others) and Norway (*Lovén*) to Rochelle (*D'Orbigny*). In America it is common on the Labrador coast, the St. Lawrence Gulf, and as far south as New York (*De Kay*).

Family Muricidæ, *Fleming.*

Trophon, *De Montfort.*

Trophon Barvicensis, *Johnston.*

Murex Barvicensis, *Johnston;* Tritonium Barvicense, *Lovén.*

Habitat.—Mr. Robertson has two live specimens of this elegant shell, taken off the west side of Cumbrae. I have not had the good fortune to meet with it. Landsborough notes it from Lamlash Bay.

British distribution.—West and north of Scotland, and the east coast as far south as the Dogger Bank, where very fine examples were got by Mr. Leckenby. Several Irish localities are also on record.

Foreign localities.—Norway and Sweden (*Sars*, and others).

* Trophon truncatus, *Ström.*

Buccinum truncatum, *Ström;* Murex Bamffius, *Montagu;* Trophon clathratus, *Forbes* and *Hanley.*

Habitat.—On gravelly and nullipore bottom in 15 fathoms—off Ascog, Bute, one live specimen; and off the west side of Cumbrae, several dead shells; scarce. Dr. Landsborough notes this species from Lamlash, where, however, Mr. Norman failed to obtain it.

British distribution.—Apparently most at home on the east coast. Alder records it as not rare off Northumberland, and Mr. Leckenby on the Dogger Bank; whilst Dr. M'Intosh

found it not uncommon at St. Andrews in fishing refuse and fish stomachs. It occurs on the north and west of Scotland and England, extending as far south as the Welsh coast; also in many Irish localities.

Foreign localities.—Norway and Sweden (*Lovén*, and others), Iceland (*Verkrüzen*), Greenland (*Fabricius*), Massachusetts (*Gould*, as Fusus Bamffius).

Fusus, *Bruguière.*

* Fusus antiquus, *Linné.*

Murex antiquus, *Linné;* Buccinum album, &c., *Lister;* Buccinum magnum, *Da Costa.*

Habitat.—From low water mark down to all depths in sand, nullipore, mud, and gravel; very common. In Fintry Bay, Cumbrae, it is common and fine at low water of spring tides, but it is more often taken in 10 to 15 fathoms water. My largest specimen was obtained by Captain Kerr, of Campbeltown, from the long line fishermen at Carradale, Kintyre; it measures nearly 8 inches long.

This shellfish, although relished by the working classes in England, is seldom or never eaten in this district, but is used for bait, being taken in creels set for the purpose. In Scotland it shares the name "buckie" with Buccinum undatum. It is the type of Swainson's genus Chrysodomus.

British distribution.—On the western, northern, and eastern coasts, and all Ireland, being plentiful in our northern seas, and becoming very scarce (or perhaps absent) in the English Channel. Lister figures it as Buccinum album, &c., "a whelke."

Foreign localities.—From Norway (*Sars, Lovén*, and others), throughout western Europe as far as the Bay of Biscay (*Cailliaud*, and others). M'Andrew records the reversed variety (*contrarius*) from northern Spain, and Mr. Jeffreys states that the same variety has been got in the Mediterranean at Barcelona and Sicily, where the normal form appears to be absent.

* Fusus gracilis, *Da Costa.*

Buccinum gracile, *Da Costa;* Murex corneus, *Donovan;* Buccinum angustius, *Lister;* Fusus Islandicus (part), *Chemnitz;* Tritonium gracile, *Lovén.*

Habitat.—From 15 fathoms downward, in mud and muddy sand all round Bute; rather common. I have also taken it

on the outer edge of the Tan Spit and off Shellbole Bay, Cumbrae; as well as off Moll Dhu and Otter, Loch Fyne. Mr. Norman and others record it from Arran.

In Rothesay Bay it inhabits the thick tenacious mud so unproductive of molluscan life; the fishermen whom I employed there soon learned to distinguish this species, dubbing it "long nose." Forbes and Hanley refer the present shell to Fusus Islandicus of Chemnitz.

British distribution.—Throughout all our seas from 15 fathoms or so downward; it becomes scarce in the south. Montagu took it frequently in the English Channel, but always dead; it has since been obtained there in a living state. Lister figures this shell, having found it on the beach at Scarborough.

Foreign localities.—Throughout the Arctic seas of both hemispheres, extending in Europe as far south as the Bay of Biscay, and in America to Massachusetts.

Family Nassidæ, *Stimpson.*

Nassa, *Lamarck.*

Nassa reticulata, *Linné.*

Buccinum reticulatum, *Linné;* Buccinum vulgatum, *Gmelin.*

Habitat.—Cumbrae, at Battery Point and Fintry Bay, in sand at low water, plentiful; common in similar localities throughout the district. Mr. Norman, however, considered it rare, having only taken two or three "unhealthy looking" specimens. I have also taken it, but not plentifully, in rock pools and below stones as high up as half-tide. On the Tan Spit, Cumbrae, it occurs alive in about 10 fathoms.

British distribution.—Everywhere; common, chiefly in sand at low tide.

Foreign localities.—Norway and Sweden (*Lovén*, and others), Spain, Portugal, Mogador, and Canaries (*M'Andrew*). It extends throughout the Mediterranean.

* Nassa incrassata, *Ström.*

Buccinum incrassatum, *Ström;* Buccinum minutum, *Pennant;* Buccinum coccinella, *Lamarck;* Buccinum macula, *Montagu.*

Habitat.—Locally common on stony and gravelly bottom, from 8 to 30 fathoms. In Cumbrae it is found everywhere below the Laminarian zone except in mud. Specially fine examples are obtained on the west side of the Tan Spit.

British distribution.—Nearly everywhere on hard ground, from the Channel Islands to Shetland.

Foreign localities.—Iceland (*Steenstrup*), Norway (*Lovén*, and others), Spain, Portugal, Madeira, and Canaries (*M'Andrew*), Açores (*Drouet*), St. Helena (*Jeffreys*), Mediterranean (both sides), Adriatic, and Ægean (*Nares*, *Forbes*, and others).

Family Pleurotomatidæ, *Lovén.*

Defrancia, *Millet.*

Defrancia teres, *Forbes.*

Pleurotoma teres, *Forbes;* Pleurotoma boreale, *Lovén;* Mangelia teres, *Forbes* and *Hanley.*

Habitat.—Outside the Tan Spit, and on a rough bank off Shellbole Bay, Cumbrae; only three or four specimens, all dead. Mr. Norman took a single specimen alive in Lamlash Bay, where Drs. Greville and Bryce are also said to have taken it. Mr. Barlee records this species from Loch Fyne.

British distribution.—Scarce throughout our seas. Mr. Jeffreys quotes the following localities—Cornwall, Plymouth, Northumberland, Durham, Berwick Bay, Shetland, Orkney, west of Scotland, Antrim, Connemara, and west of Ireland.

Foreign localities.—Norway and Sweden (*Lovén*, and others), Spain, Madeira, and Canaries (*M'Andrew*), the Mediterranean and Ægean (*Spratt*, and others).

Defrancia gracilis, *Montagu.*

Murex gracilis, *Montagu;* Murex emarginatus. *Donovan;* Pleurotoma gracilis, *Fleming;* Mangelia gracilis, *Forbes* and *Hanley;* Pleurotoma vulpecula (of Brocchi), *Lamarck*, ed. *Desh.*

Habitat.—On hard ground from 10 to 25 fathoms; a rather scarce shell. I have taken fine specimens on Bogany Point, and on the Craigmore shore, in Bute; off the Little Cumbrae, south of the Castle; and on the rough bouldery bank off Shellbole Bay, Cumbrae. My finest specimens measure $1\frac{1}{10}''$ in length. Mr. Norman does not seem to have taken this species, but M'Andrew and Landsborough record it from the Clyde district.

British distribution.—From Guernsey to Shetland; common in the south, becoming scarcer on the western and

northern coasts of Scotland. I have not observed any very trustworthy notice of its occurrence on the east coast. It is found throughout the greater part of Ireland.

Foreign localities.—Western France, Spain, Portugal, Madeira, and Canaries (*M'Andrew*), and throughout the Mediterranean, Adriatic, and Ægean (*Forbes, Nares*, and others).

* Defrancia Leufroyi, *Michaud.*

Pleurotoma Leufroyi, *Michaud;* Pleurotoma sinuosa, *Fleming;* Fusus Boothii, *Brown;* Mangelia Leufroyi, *Forbes* and *Hanley.*

Habitat.—I have only taken two live examples—one on the rough bank off Shellbole Bay, Cumbrae, in 15 fathoms stones and nullipore; and one in 6 fathoms stony ground opposite Otter, Loch Fyne.. A few dead shells were also obtained in same localities. It has been taken by Professor Forbes, Dr. Bryce, and others in Lamlash Bay, Arran; whilst Mr. Norman states that it is frequent in other parts of the Clyde.

British distribution.—From the Channel Islands to Shetland; a scarce and local species.

Foreign localities.—Southern Norway and Sweden (*Sars*, and others), Spain, Madeira, and Canaries (*M'Andrew*), Mediterranean and Ægean Seas (*Forbes*, and others).

* Defrancia linearis, *Montagu.*

Murex linearis, *Montagu;* Murex elegans, *Donovan;* Pleurotoma lineare, *Fleming;* Fusus Buchanensis, *Macgillivray;* Mangelia linearis, *Forbes* and *Hanley;* Fusus multilinearis, *Brown;* Mangelia Cranchiana, *Leach.*

Habitat.—From 5 to 25 fathoms on gravel, coarse sand, and nullipore; everywhere throughout the district. Dead shells are very numerous, but live specimens, and especially full-grown ones, are by no means so. My finest specimens are from off Silvercraigs, Loch Fyne; they probably belong to the variety *æqualis.*

British distribution.—Throughout our seas, chiefly in the Coralline zone; a rather common shell.

Foreign localities.—Iceland (*Steenstrup*), Norway (*Lovén*, and others), Spain, Madeira, and Canaries (*M'Andrew*), Mediterranean, Adriatic, and Ægean (*Scacchi, Forbes*, and others).

Defrancia purpurea, *Montagu.*

Murex purpureus, *Montagu;* Fusus purpureus, *Fleming;* Mangelia purpurea, *Forbes* and *Hanley.*

Habitat.—On the outside edge of the Tan Spit, Cumbrae, in 10 to 20 fathoms sand and nullipore; by no means common. Also off Otter, Loch Fyne, where a dead specimen, $1\frac{2}{10}$ inches long, was obtained. Mr. Norman dredged a few specimens at Arran, between Clachland Point and Holy Island, and found a dwarf form in some numbers in a rock pool on the Allans Rocks, Millport Bay (probably the variety *Philberti*).

British distribution.—On the south-western, western, and northern coasts of these islands; generally scarce. Except in the report of Messrs. Brady and Robertson's dredging in 1874 on the Northumberland coast, I have not noticed any locality for this shell on our eastern coast.

Foreign localities.—From Norway throughout western Europe, the Mediterranean, and Ægean. M'Andrew records it from Mogador, Madeira, and Canaries.

Pleurotoma, *Lamarck.*

Pleurotoma striolata, *Philippi.*

Pleurotoma striolatum, *Philippi;* Pleurotoma Smithii, *Forbes;* Fusus elegans, *Brown;* Mangelia striolata, *Forbes* and *Hanley.*

Habitat.—In 15 to 20 fathoms, gravel and stones, off Little Cumbrae and outside the Tan Spit; also off Otter, Loch Fyne. Although by no means common in a live state, dead shells and fragments are generally distributed in the district.

British distribution.—Southern and western coasts of England and Wales, and all round Ireland. I have not noticed any north or east coast localities.

Foreign localities.—Norway and Sweden (*Danielssen*), western France (*Caillaud*), Spain, Portugal, Madeira, and Canaries (*M'Andrew*), Mediterranean (*Philippi*, *Nares*, and others).

Pleurotoma costata, *Donovan.*

Murex costatus, *Donovan;* Fusus costatus, *Fleming;* Pleurotoma coarctata, *Forbes;* Mangelia costata, *Forbes* and *Hanley.*

Habitat.—With the preceding, but only dead shells obtained. Mr. Norman has taken it "occasionally in deep

water." It seems to be rare in this district, although Mr. Jeffreys speaks of it as a common shell.

British distribution.—Throughout the southern, western, and northern coasts of Britain; generally distributed. On the eastern coast it is recorded from St. Andrews (*M'Intosh*) and Northumberland (*Alder*).

Foreign localities.—From Norway (*Lovén*, and others), throughout western Europe and the Mediterranean as far as the Adriatic (*Brusina*).

Pleurotoma brachystoma, *Philippi.*

Pleurotoma brachystomum, *Philippi;* Mangilia tiarula, *Lovén;* Mangelia brachystoma, *Forbes* and *Hanley.*

Habitat.—A single dead and worn specimen in Rothesay Bay.

British distribution.—Scarce and local, but dispersed over nearly all our coasts from Cornwall to Shetland.

Foreign localities.—From Norway and Sweden (*Lovén*, and others), throughout western Europe, the Mediterranean, Adriatic, and Ægean Seas (*Forbes*). In the Atlantic it ranges as far south as Mogador, where M'Andrew records it as frequent in 36 fathoms.

* Pleurotoma nebula, *Montagu.*

Murex nebula, *Montagu;* Mangelia nebula, *Forbes* and *Hanley.*

Habitat.—Scarce in muddy gravel and stones in 10 to 25 fathoms off Moll Dhu and Silvercraigs, Loch Fyne; and outside the Tan Spit, Cumbrae; living in these localities, but only one or two specimens from each.

British distribution.—On all our coasts; apparently not uncommon in the south from low water down to a few fathoms. In Scotch waters it seems to be much scarcer, and to inhabit a rather deeper zone.

Foreign localities.—North of France (*De Gerville*), Spain, Portugal, and Madeira (*M'Andrew*), Mediterranean, Adriatic, and Ægean Seas (*Philippi, Spratt,* and others).

Pleurotoma septangularis, *Montagu.*

Murex septangularis, *Montagu;* Murex costatus, *Pulteney;* Murex septem-angulatus, *Donovan;* Pleurotoma secalinum, *Philippi;* Mangelia septangularis, *Forbes* and *Hanley.*

Habitat.—I have never taken this species, but have seen a single live example in Mr. Robertson's cabinet, dredged off Cumbrae. Mr. Norman records it as rare in Lamlash Bay.

British distribution.—Chiefly in the Coralline zone on the southern and western coasts of Britain, and all round Ireland. Mr. Barlee has taken it in the Hebrides, and Professor Edward Forbes in the Firth of Forth. This latter is the only reliable instance which I have observed of its occurrence on our eastern coast.

Foreign localities.—The Atlantic coast from France to the Canaries, and throughout the Mediterranean and Ægean Seas.

Pleurotoma rufa, *Montagu.*

Murex rufus, *Montagu;* Fusus fuscus, *Brown;* Mangelia (Bela) rufa, *Forbes* and *Hanley.*

Habitat.—Two small specimens, dead but apparently fresh, from Lamlash Bay are all that I have seen—they were obtained by my brother many years ago. Messrs. Greville and Miles dredged a single example from the same bay, from whence also Dr. Landsborough reports it.

British distribution.—On nearly all our coasts from the Channel Islands to the Hebrides on the west, and Moray Firth on the east.

Foreign localities.—Norway (*Sars*), northern and western France (*Macé*, and others), "Naples (*Tiberi*, and others)," Brit. Con. Supp.

* Pleurotoma turricula, *Montagu.*

Murex turricula, *Montagu;* Murex angulatus, *Donovan;* Defrancia nobilis and D. scalaris, *Möller;* Fusus turricola, *Fleming;* Mangelia (Bela) turricula, *Forbes* and *Hanley.* The variety rosea = Tritoneum roseum, *Sars.*

Habitat.—On hard ground—gravel and stones—from 8 to 30 fathoms; rather common in most parts of our Firth. It is to be obtained specially fine and plentiful off Bogany, in Bute. The variety *rosea* occurs with the type.

British distribution.—On all the English and Scotch coasts north of the Bristol Channel, and round the whole of Ireland, but probably most at home in the west of Scotland. Messrs. Leckenby and Marshall record it as very fine on the Dogger Bank. Mr. Jeffreys is not satisfied that it has been found on the southern coast of England, but it undoubtedly occurs on the opposite coast of France.

Foreign localities.—Northern France (*De Gerville*, and others), Norway (*Lovén*, and others), Iceland (*Verkrüzen*), Greenland (*Möller*), Labrador (*Packard*), St. Lawrence (*Whiteaves*), Massachusetts (*Gould*).

Family Cypræidæ, *Fleming.*

Cypræa, *Linné.*

Cypræa Europæa, *Montagu.*

Cypræa pediculus, *Linné* (part).; Concha Veneris, &c., *Lister;* Cypræa arctica, *Pulteney;* Cypræa coccinella, *Lamarck;* Cypræa Norvegica, *Sars.*

Habitat.—On rocky and bouldery bottoms, whence it is difficult to obtain live specimens; dead shells are sometimes thrown on the beach in considerable numbers, especially in sandy bays which are intersected or bounded by reefs of rocks, such as Machrihanish Bay and the south end of Kintyre, the south end of Arran and the Ayrshire coast. In Cumbrae I have dredged live specimens on the rough bank off Shellbole Bay, and have taken one specimen at low water on Farland Point. This latter had a pale yellow mantle decorated with orange warts, which it exhibited to perfection for a few hours in the aquarium, but speedily becoming sick or exhausted, it was delivered over to the vivisectionist for the sake of its lingual ribband. Lister tells us that the Concha Veneris was called "Nun" in his day; our Lowland children call them "Groats," or as Jeffreys puts it—"John o'Groats' buckies"; the Highland youngsters name them "Maidens." Aldrovandus, although a sage, was scarcely less fanciful than our children, but his explanation of how the name Concha venerea arose will not bear translation.† The genus figures in the early pharmacopeia, and Olaus Wormius says that it was regarded as a specific for whooping cough.

British distribution.—Throughout all our coasts on hard ground, being found living from low water mark to all depths. Dead shells are thrown up on sandy shores in great numbers.

Foreign localities.—From Norway (*Lovén*, and others) to Spain and Portugal (*M'Andrew*), the Mediterranean, Adriatic, and Ægean (*Nares*, and others).

Order Pleurobranchiata, *Gray.*

Family Bullidæ, *Clark.*

Cylichna, *Lovén.*

Cylichna acuminata, *Bruguière.*

Bulla acuminata, *Bruguière;* Ovula acuminata, *Forbes* and *Hanley.*

Habitat.—In muddy sand mixed with nullipore, 10

† Concha Venerea sic dicta quia partem fœmineam quodam modo repræsentat: externe quidem per labiorum fissuram, interne vero propter cavitatem uterum mentientem.—*Aldrovandi Opera, De exsanguibus.*

fathoms; locally abundant on the Tan Spit, Cumbrae, where in one haul I took over 30 live specimens. Excepting on this occasion I have never met with even a single live individual of this species, although I must have often dredged within a very short distance of the spot where so many were got. Mr. Robertson, who has dredged this ground for very many years, has never met with this species there. It has been taken at Lamlash by Dr. Landsborough and Mr. Alder, and in Loch Fyne by Mr. Robertson and others.

British distribution.—West, north, and north-east of Scotland; all round Ireland, and on the Cornish coast.

Foreign localities.—Throughout western Europe from Norway (*Lilljeborg*) to Gibraltar (*M'Andrew*); all the Mediterranean and Adriatic seas, and as far as the Ægean (*Forbes*). M'Andrew records two specimens of this shell from the Gulf of Suez, taken during a dredging excursion in 1869.

Cylichna nitidula, *Lovén.*

Habitat.—Scarce in sandy and shelly mud, 10 or 12 fathoms, on the Tan Spit, Cumbrae—dead specimens only. It has been taken in Loch Fyne by Mr. Jeffreys and Mr. Barlee.

British distribution.—Very local. It is noted from the Antrim coast, Shetland, Aberdeenshire, Berwick Bay, and the Dogger Bank.

Foreign localities.—Norway and Sweden (*Lovén, Jeffreys,* and others), northern and western France (*De Folin,* and others).

Cylichna umbilicata, *Montagu.*

Bulla umbilicata, *Montagu;* Volvaria subcylindrica, *Brown.*

Habitat.—On the Tan Spit, Cumbrae, and occasionally throughout the whole district; usually in muddy sand in 10 to 20 fathoms. Dead specimens are rather common, but I have never taken the species alive. Mr. Norman records it as rare in Lamlash Bay.

British distribution.—Apparently throughout most of our western seas from Cornwall to Shetland, and all round Ireland. On the east coast it occurs on the Dogger Bank (*Leckenby* and *Marshall*), and on the coasts of Northumberland and Durham (*Alder*).

Foreign localities.—In Europe from Norway (*Sars,* and others), throughout the Atlantic coast to Gibraltar, both sides of the Mediterranean, the Adriatic, and as far as the

Ægean Sea (*Forbes*). In America, Mr. Whiteaves informs me he has dredged this species in the neighbourhood of Gaspé.

* Cylichna cylindracea, *Pennant.*

Bulla cylindracea, *Pennant;* Bulla oliva, *Gmelin;* Bulla cylindrica, *Pulteney;* Volvaria cylindrica, *Brown.*

Habitat.—Common in mud, muddy sand, and nullipore in 8 to 30 fathoms; everywhere in Bute and Cumbrae, and generally throughout the district.

British distribution.—Nearly everywhere in muddy sand; a common species. Mr. Jeffreys gives Loch Fyne as a locality for the variety *linearis*, which I have never seen.

Foreign localities.—Norway and Sweden (*Lovén*, and others), and throughout the Atlantic coasts as far as Mogador and the Canaries (*M'Andrew*), Mediterranean and Adriatic to the Ægean Sea (*Forbes*).

UTRICULUS, *Brown.*

* Utriculus mammillatus, *Philippi.*

Bulla mammillata, *Philippi;* Bulla striatula, *Forbes;* Bulla minuta, *Macgillivray;* Cylichna mammillata, *Forbes* and *Hanley.*

Habitat.—On the Tan Spit, Cumbrae; Ascog shore and Bogany Point, Bute; and off Silvercraigs, Loch Fyne; scarce in a living state—dead shells not uncommon. It inhabits a bottom of muddy sand and nullipore, in about 8 to 12 fathoms. Mr. Norman records it from Lamlash Bay.

British distribution.—South-western and western coasts, all Ireland, north of Scotland, and the east coast as far south as Yorkshire.

Foreign localities.—Norway and Sweden (*Lovén*, and others); French, Spanish, and Portuguese coasts; all the Mediterranean as far as the Ægean (*Forbes*). M'Andrew records it from the Canaries.

* Utriculus truncatulus, *Bruguière.*

Bulla truncatula, *Bruguière;* Bulla truncata, *Adams;* Volvaria truncata, *Brown;* Cylichna truncata, *Forbes* and *Hanley.*

Habitat.—Among small seaweeds in rock pools and at the roots of Laminariæ at low tide, as well as in sand below stones between tide marks; rather common throughout the

district. I have noticed it more frequently than elsewhere at Farland Point, Cumbrae. It occurs also down to 10 or 12 fathoms between the two Cumbraes and off Silvercraigs, Loch Fyne. Mr. Norman records it as abundant in rock pools in all parts of the Clyde.

British distribution.—Everywhere throughout our seas; common at low water and down to a few fathoms.

Foreign localities.—From Norway (*Lovén* and others), throughout western Europe to Mogador and the Canaries (*M'Andrew*). It inhabits both sides of the Mediterranean, the Adriatic, and Ægean Seas.

* Utriculus obtusus, *Montagu.*

Bulla obtusa, *Montagu;* Utriculus discors and U. plicatus, *Brown;* Cylichna obtusa, *Forbes* and *Hanley.*

Habitat.—On the Tan Spit, Cumbrae; and off Silvercraigs, Loch Fyne; I have dredged this species alive in 8 fathoms, on a bottom of muddy sand and nullipore; not common, and always small.

British distribution.—From low water mark to considerable depths on many parts of our coast; gregarious and local.

Foreign localities.—Mr. Jeffreys, in Brit. Con., gives Iceland (*Torell*), Denmark, Holland (*Menke*), Normandy (*Macé*), Bay of Biscay (*D'Orbigny*, and others), Adriatic (*Brusina*); and in Ann. and Mag. Nat. Hist. he records it as dredged by Nares or Spratt in the Mediterranean. In America it is on record (but with doubt as to identity) from Massachusetts—as Bulla obstricta (*Gould*).

* Utriculus hyalinus, *Turton.*

Bulla hyalina, *Turton;* Diaphana pellucida, *Johnston;* Utriculus pellucidus, *Brown;* Amphisphyra pellucida, *Lovén;* Amphisphyra hyalina, *Forbes* and *Hanley.*

Habitat.—In the Laminarian and upper part of the Coralline zone; not uncommon, but seldom full grown. I have dredged it off Battery Point, Cumbrae; and on the west side of Little Cumbrae; at Ardmaleish, Bute; and at Moll Dhu and Silvercraigs, Loch Fyne. At Farland Point, Cumbrae, I have taken this shell below stones a little above low water, Mr. Norman says that it occurs in rock pools throughout the Clyde district.

British distribution.—Local throughout all our seas—west, south, and north. On the east coast it extends south to the Dogger Bank and Yorkshire coast (*Alder* and *Leckenby*).

Foreign localities.—Iceland (*Torell* and *Verkrüzen*), Norway (*Lovén*, and others), Kiel Bay (*Meyer* and *Möbius*), Madeira (*M'Andrew*—one specimen), Greenland (*Möller*), St. Lawrence (*Whiteaves*), Massachusetts (*Gould*).

Acera, *Müller.*

Acera bullata, *Müller.*

Akera bullata, *Müller;* Bulla akera, *Gmelin;* Bulla Norwegica, *Bruguière;* Bulla resiliens, *Donovan;* Akera flexilis, *Brown.*

Habitat.—A single specimen on the shore at Farland Point, Cumbrae; dead, but with the remains of the animal adhering. It has been taken in Lamlash Bay by Mr. Norman, who records it as scarce. Its proper zone is the sub-littoral or Laminarian.

British distribution.—Throughout our seas; very abundant in many muddy estuaries in the south of England, but much scarcer in the north. It extends to our Ultima Thule —Unst—and to the opposite extreme in the Scilly and Channel Islands.

Foreign localities.—From Norway (*Sars, Lovén,* and others) to Northern Spain (*M'Andrew*), as well as in the Mediterranean, Adriatic, and Ægean Seas.

Actæon, *De Montfort.*

* Actæon tornatilis, *Linné.*

Voluta tornatilis, *Linné;* Turbo ovalis, *Da Costa;* Tornatella fasciata, *Lamarck,* id. *Forbes* and *Hanley.*

Habitat.—Scarce, but widely distributed in the district. I have taken it living in Kamesburgh Bay and off Ardbeg and Bogany Points, Bute, in 8 to 15 fathoms, in gravelly and muddy sand—dead specimens off Toward Point, Tan Spit, and Ardrishaig. Mr. Norman has taken it sparingly off Cumbrae and in Lamlash Bay.

British distribution.—Throughout all our seas from low water mark to considerable depths, and generally not uncommon.

Foreign localities.—From Iceland (*Verkrüzen*) and Norway (*Lovén*, and others) to Spain, Portugal, and Mogador (*M'Andrew*), and throughout the Mediterranean as far as the Ægean (*Forbes*).

Bulla, *Klein.*

Bulla utriculus, *Brocchi.*

Bulla Cranchii, *Leach*, id. *Forbes* and *Hanley*; Bulla punctura, *Johnston*; Bulla striata, *Brown.*

Habitat.—Alive in 18 to 30 fathoms in muddy sand and gravel, off Little Cumbrae, between the Castle and Lighthouse, and on the rough bank off Shellbole Bay, Cumbrae. In Bute I have taken it on Bogany Point, and it occurs between Toward Point and Innellan; a scarce shell, only one or two examples obtained at each locality.

British distribution.—Throughout all our seas; widely distributed, but never plentiful.

Foreign localities.—Norway and western Europe, and as far as the Canaries. It inhabits all the Mediterranean, the Adriatic, and Ægean Seas; Massachusetts (as Cylichna oryza, *Totten*, fide *J. G. Jeffreys*).

Scaphander, *De Montfort.*

(? *) Scaphander lignarius, *Linné.*

Bulla lignaria, *Linné.*

Habitat.—Rather common in 8 to 20 fathoms on muddy sand and gravel off Garroch Head, Mountstuart, Ascog, and Craigmore, Bute; in Millport Bay, on the Tan Spit, and off Kames Bay, Cumbrae; off Silvercraigs and Otter Spit, Loch Fyne; and probably throughout the district. Dr. Landsborough says that it can be got in Lamlash Bay by digging in the sand at ebb tide.

British distribution.—Common throughout all our seas, chiefly in the Coralline zone; occasionally taken by fishermen on their lines.

Foreign localities.—From Norway throughout western Europe, the Mediterranean, Adriatic, and Ægean Seas.

Philine, *Ascanius.*

Philine scabra, *Müller.*

Bulla scabra, *Müller*; Bulla pectinata, *Dillwyn*; Bullæa granulosa, *Sars.*

Habitat.—In muddy sand in about 8 to 18 fathoms. I have taken it on the Tan Spit, Cumbrae; off Ascog and

Craigmore, Bute; and at Lochgoilhead, at which latter locality several fine examples were obtained.

British distribution.—Everywhere throughout our seas; rather a common species. Dr. M'Intosh speaks of it as abundant in St. Andrews Bay.

Foreign localities.—Greenland (*Möller*), Iceland (*Verkrüzen*), Norway (*Sars*, and others), northern Spain (*M'Andrew*), Mediterranean (*Nares*, and others).

Philine catena, *Montagu.*

Bulla catena, *Montagu;* Bulla punctata, *Adams.*

Habitat.—In muddy sand off Ascog, Bute, in 8 or 10 fathoms; a single live example.

British distribution.—Throughout all our seas, but more frequent in the south.

Foreign localities.—Bay of Biscay (*Cailliaud*), Mediterranean and Ægean Seas (*Forbes*, and others).

Philine punctata, *Clark.*

Bullæa punctata, *Clark;* Bullæa alata, *Forbes.*

Habitat.—A single live specimen in 10 fathoms muddy sand on the Tan Spit, Cumbrae. Mr. Robertson records it also from Cumbrae.

British distribution.—Like the allied forms it is spread throughout all our seas, but is a scarce species.

Foreign localities.—Mr. Jeffreys in Brit. Con. gives Norway (*Sars*), Sweden (*Malm*), Algiers (*M'Andrew*), Naples (*Stefanis*), Ægean (*Forbes*).

Philine pruinosa, *Clark.*

Bullæa pruinosa, *Clark.*

Habitat.—In muddy sand in 3 to 15 fathoms on, and outside of, the Tan Spit, Cumbrae; only two live specimens and some fragments obtained.

British distribution.—Throughout our seas, but very local and scarce. The localities on record are Exmouth, Plymouth, Northumberland coast, Firth of Forth, Aberdeenshire, Moray Firth, Shetland, and Hebrides, as well as the Clyde district.

Foreign localities.—Norway and Sweden (*Sars*, and others), and (Brit. Con. Supp.) Dalmatia (*Brusina*).

Philine aperta, *Linné.*

Bulla aperta, *Linné;* Philine quadripartita, *Ascanius;* Bullæa Planciana, *Lamarck;* Lobaria quadriloba, *Gmelin.*

Habitat.—In sand, muddy sand, and gravel in from 8 to 20 fathoms in Millport Bay and on the Tan Spit, Cumbrae (scarce); off Craigmore and Garroch Head (plentiful); at Lochgoilhead, about half a mile below Douglas Pier (not uncommon). Our Clyde specimens are generally small. In a specimen dredged at Lochgoilhead there were two dark spots in "the place where the eyes ought to grow;" these spots presented the appearance of subcutaneous eyes, but whether they were so or not I cannot say, not having been able to preserve the specimen, of which, however, I have a drawing. This species occurs throughout our district, but is generally scarce. Mr. Robertson informs me that it is exceedingly abundant at Loch Ryan.

British distribution.—Ranging from St. Andrews on the east coast, and Oban on the west, to all our southern waters; it is locally common.

Foreign localities.—From Norway (*Lovén*, and others), throughout western Europe to Mogador and the Canary Islands, as well as throughout the Mediterranean, Adriatic, and Ægean Seas. The older authors—Linné, Chemnitz, &c.—give the Cape of Good Hope as the *locus* of this shell; whilst Martini (who, however, probably confuses other species in his account) gives a nearly world-wide distribution, and quotes some fifty names, more or less barbarous, by which the shell was known in his day (1769).

Family Aplysiidæ, *D'Orbigny.*

Aplysia, *Linné.*

Aplysia punctata, *Cuvier.*

Aplysia hybrida, *J. Sowerby*, id. *Forbes* and *Hanley.*

Habitat.—Occasionally in rock pools on the south end of Cumbrae, and more commonly in the Laminarian zone there. I have noted it also from Kamesburgh Bay, Bute. Mr. Robertson records it as common in our Firth.

British distribution.—Throughout all our coasts; not uncommon.

Foreign localities.—All western and southern Europe from Norway to France, Spain, and throughout the Mediterranean Sea. M'Andrew records it (as A. hybrida?) from Mogador and the Canaries.

FAMILY PLEUROBRANCHIDÆ, *Forbes* and *Hanley*.

PLEUROBRANCHUS, *Cuvier*.

Pleurobranchus plumula, *Montagu*.

Bulla plumula, *Montagu*.

Habitat.—Under stones at lowest ebb of spring tides at Farland Point, Cumbrae; scarce. Mr. Robertson has found it not unfrequent in similar situations, and down to 15 fathoms—the specimens from the latter depth being from fishermen's lines. Messrs. Greville and Miles found a Pleurobranchus at Holy Island, Lamlash; probably referable to the present species.

British distribution.—Throughout many parts of our coasts, but local. It appears scarcer on the east coast, not having been found by Dr. M'Intosh at St. Andrews, nor by Mr. Alder; it is, however, recorded by Dr. Johnston from Holy Island, near Berwick.

Foreign localities.—Mr. Jeffreys states that it ranges from Sweden, throughout France, the Mediterranean, Adriatic, and Ægean Seas.

FAMILY RUNCINIDÆ, *Gray*.

RUNCINA, *Forbes*.

Runcina Hancocki, *Forbes*.

Habitat.—Rock pools, Farland Point, Cumbrae, in company with the Limapontia (*Norman*).

ORDER NUDIBRANCHIATA, *Cuvier*.

(SUB-ORDER PELLIBRANCHIATA.)

FAMILY LIMAPONTIIDÆ, *Alder* and *Hancock*.

LIMAPONTIA, *Johnston*.

Limapontia nigra, *Johnston*.

Habitat.—In rock pools at Farland Point, Cumbrae; abundant (*Norman*). I have not noticed either this or the preceding species.

FAMILY ELYSIIDÆ, *Alder* and *Hancock*.

ELYSIA, *Risso*.

Elysia viridis, *Montagu*.

Habitat.—In rock pools on the coasts of Bute and Cumbrae (*A. Brown*); common on all the coast (*Norman*).

(Sub-Order Polybranchiata.)

Family Hermæidæ, *Alder* and *Hancock.*

Hermæa, *Lovén.*

Hermæa bifida, *Montagu.*

Habitat.—Moderately common; dredged at Cumbrae on Griffithsia corallina (*Robertson*).

Family Eolididæ, *D'Orbigny.*

Embletonia, *Alder* and *Hancock.*

Embletonia pulchra, *Alder* and *Hancock.*

Habitat.—Within tide marks at Rothesay (*Alder*), Saltcoats (*Landsborough*).

Eolis, *Cuvier.*

Eolis papillosa, *Linné.*

Habitat.—Under stones near low tide; common at Cumbrae (*A. Brown*), Lamlash (*Alder*).

Eolis coronata, *Forbes.*

Habitat.—In the Laminarian zone on the south and west of Bute; scarce (*A. Brown*); Rothesay (*Alder*); under stones at low tide at Cumbrae and Arran; common (*Norman*); dredged at Cumbrae; moderately common (*Robertson*).

Eolis Drummondi, *Thompson.*

Habitat.—Under stones at low tide, Cumbrae and Arran; common (*Norman*); common at Cumbrae; dredged and between tide marks (*Robertson*).

Eolis rufibranchialis, *Johnston.*

Habitat.—Lamlash (*Landsborough*).

Eolis lineata, *Lovén.*

Habitat.—Between tide marks and down to a few fathoms off south end of Bute (*A. Brown*); in 25 fathoms stony ground, Cumbrae (*Robertson*); Saltcoats (*Landsborough*).

Eolis gracilis, *Alder* and *Hancock.*

Habitat.—Under stones at low tide, Cumbrae—moderately rare (*Robertson*).

Eolis smaragdina, *Alder* and *Hancock.*

Habitat.—Doubtfully at Cumbrae (*Norman*).

Eolis Landsburgi, *Alder* and *Hancock*.

Habitat.—Cumbrae (*Norman*); Saltcoats (*Landsborough*).

Eolis alba, *Alder* and *Hancock*.

Habitat.—Cumbrae, at low tide and dredged (*Robertson*); Ascog (*A. Brown*); Rothesay Bay (*Alder*); Lamlash (*Landsborough*).

Eolis Peachii, *Alder* and *Hancock*.

Habitat.—Cumbrae, rare, dredged (*Robertson*).

Eolis nana, *Alder* and *Hancock*.

Habitat.—Cumbrae, rare; on shell of Pagurus Bernhardus (*Robertson*).

Eolis concinna, *Alder* and *Hancock*.

Habitat.—Cumbrae, very rare; under stones at low tide (*Robertson*); Kyles of Bute—one example (*A. Brown*).

Eolis olivacea, *Alder* and *Hancock*.

Habitat.—Under stones at low tide, Rothesay Bay (*Alder*); Cumbrae (*Robertson*); Lamlash (*Landsborough*).

Eolis aurantiaca, *Alder* and *Hancock*.

Habitat.—Ardrossan (*Alder*); Cumbrae, moderately rare, dredged 25 fathoms (*Robertson*); Kyles of Bute, in 6 or 7 fathoms (*A. Brown*).

Eolis amœna, *Alder* and *Hancock*.

Habitat.—Cumbrae, moderately rare in 10 fathoms (*Robertson*); Kyles of Bute, in 6 or 7 fathoms (*A. Brown*).

Eolis Glottensis, *Alder* and *Hancock*.

Habitat.—Lamlash Bay, on Pecten opercularis (*Alder*); Cumbrae, on zoophytes on gravelly bottom, rare (*Robertson*).

Eolis viridis, *Forbes*.

Habitat.—Saltcoats and Portincross, at low tide (*Landsborough*); Cumbrae, moderately common (*Robertson*); Bute (*A. Brown*).

Eolis cingulata, *Alder* and *Hancock*.

Habitat.—Cumbrae, under stones at low tide; very rare (*Robertson*).

Eolis picta, *Alder* and *Hancock*.

Habitat.—Cumbrae, rare; dredged on Tubularia indivisa, gravelly bottom (*Robertson*); Kyles of Bute and Ascog, in 6 or 8 fathoms (*A. Brown*).

Eolis amethystina, *Alder* and *Hancock*.

Habitat.—Lamlash Bay (*Landsborough*).

Eolis exigua, *Alder* and *Hancock*.

Habitat.—Cumbrae, moderately rare at extreme low water, and dredged on Laminaria saccharina (*Robertson*).

FAMILY DOTONIDÆ.

DOTO, *Oken*.

Doto fragilis, *Forbes*.

Habitat.—Cumbrae and Arran (*Norman*); Cumbrae, dredged in zoophytes, moderately rare (*Robertson*); Kyles of Bute, in about 8 fathoms (*A. Brown*).

Doto coronata, *Gmelin*.

Habitat.—Lamlash (*Landsborough*); Cumbrae, dredged (*Norman* and *Robertson*); Kyles of Bute, in 6 or 8 fathoms, hard ground (*A. Brown*).

FAMILY DENDRONOTIDÆ.

DENDRONOTUS, *Alder* and *Hancock*.

Dendronotus arborescens, *Müller*.

Habitat.—Lamlash (*Landsborough*); Cumbrae, locally common on stones at low tide (*Robertson*).

HERO, *Lovén*.

Hero formosa, *Lovén*.

Habitat.—Cumbrae, very rare, dredged among Melobesia (*Robertson*).

LOMANOTUS, *Verany*.

Lomanotus flavidus, *Alder* and *Hancock*.

Habitat.—Lamlash Bay, a single example dredged in 3 or 4 fathoms (*Alder*). Messrs. Greville and Miles dredged a Lomanotus in 10 or 15 fathoms in Brodick Bay, but the species was not determined.

FAMILY TRITONIIDÆ, *H.* and *A. Adams.*

TRITONIA, *Cuvier.*

Tritonia Hombergi, *Cuvier.*

Habitat.—Cumbrae, dredged and at low tide (*Robertson*).

Tritonia plebeia, *Johnston.*

Habitat.—Rothesay Bay (*Alder*); Cumbrae, on stones at low water, common (*Robertson*); Skelmorlie Bank and Ascog (*A. Brown*).

(SUB-ORDER ACANTHOBRANCHIATA.)

FAMILY POLYCERIDÆ.

ÆGIRUS, *Lovén.*

Ægirus punctilucens, *D'Orbigny.*

Habitat.—Ardrossan and Lamlash (*Alder*); Cumbrae, under stones at lowest tides, moderately common (*Robertson*).

TRIOPA, *Johnston.*

Triopa claviger, *Müller.*

Habitat.—Common at Cumbrae in rock pools (*Norman, Robertson,* and *A. Brown*); dredged in 5 or 6 fathoms off Ascog (*A. Brown*); Lamlash (*Norman*).

POLYCERA, *Cuvier.*

Polycera quadrilineata, *Müller.*

Habitat.—Common at low tide and in the Laminarian zone, Cumbrae (*Landsborough* and *Robertson*); Lamlash (*Greville* and *Miles*); Ascog (*A. Brown*).

Polycera ocellata, *Alder* and *Hancock.*

Habitat.—Lamlash (*Landsborough*); Cumbrae, under stones at low water, moderately common (*Robertson*).

ANCULA, *Lovén.*

Ancula cristata, *Alder.*

Habitat.—Cumbrae, on stones at low tide, moderately common (*Robertson*); Kyles of Bute (*A. Brown*).

GONIODORIS, *Forbes.*

Goniodoris nodosa, *Montagu.*

Habitat.—Ardrossan, plentiful (*Alder*); Holy Island, Lam-

lash (*Greville* and *Miles*); Cumbrae, at low tide and dredged, common (*Robertson*); common on east coast of Bute (*A. Brown*).

Goniodoris castanea, *Alder* and *Hancock*.

Habitat.—Saltcoats (*Landsborough*).

Family Doridide.

Doris, *Linné*.

Doris tuberculata, *Cuvier*.

Habitat.—Common throughout our Firth below stones near low tide. It is the largest and commonest of our Doridide.

Doris flammea, *Alder* and *Hancock*.

Habitat.—Rothesay (*Alder*); Lamlash (*Landsborough*); Cumbrae (*Norman*). Scarce on stones and dead shells in 3 or 4 fathoms.

Doris testudinaria, *Risso*.

Habitat.—Dredged in Lamlash Bay (*Alder*); Cumbrae at lowest tides, rare (*Robertson*). This species usually appears in catalogues as Doris planata (*Alder* and *Hancock*), which is the young state of Risso's species.

Doris Johnstoni, *Alder* and *Hancock*.

Habitat.—Lamlash and Rothesay (*Alder*); Cumbrae, on stones between tide marks (*Robertson*); Ascog and Kyles of Bute, low tide, and in a few fathoms of water (*A. Brown*).

Doris repanda, *Alder* and *Hancock*.

Habitat.—Cumbrae, rare at low tide (*Robertson*); Ardmaleish Point, Bute (*A. Brown*).

Doris aspera, *Alder* and *Hancock*.

Habitat.—Rothesay (*Alder*); Cumbrae, common on Laminaria saccharina and between tide marks (*A. Brown*).

Doris bilamellata, *Linné*.

Habitat.—Lamlash Bay (*Landsborough*); Holy Isle, under stones at low tide (*Greville* and *Miles*); Cumbrae, common (*Norman, Robertson*, and *A. Brown*).

Doris depressa, *Alder* and *Hancock*.

Habitat.—Cumbrae, in company with the preceding, two examples at Farland Point (*A. Brown*).

Doris pilosa, *Müller*.

Habitat.—Cumbrae, moderately common on stones at low tide (*Robertson*).

Order Pulmonobranchiata, *Sowerby*.

Family Carychiidæ.

Melampus, *De Montfort*.

Melampus bidentatus, *Montagu*.

Voluta bidentata, *Montagu*. Under the same specific name Férussac refers it to the genus Auricula; Fleming to Actæon; Brown to Jaminia; Bivona to Ovatella; Gray, Clark, and Forbes and Hanley to Conovulus.

Habitat.—I obtained 20 or 30 live specimens at Farland Point, Cumbrae. This is the only colony I have met with; they were under a large loose stone lying on fœtid decayed seaweed, just below the line of high water. A few dead shells were got in Millport Bay, and Mr. Norman has taken it dead in Lamlash Bay.

British distribution.—Throughout our seas; often abundant where found, but exceedingly local.

Foreign localities.—Mr. Jeffreys gives northern and western France, the Mediterranean and Adriatic Seas, and Madeira.

Class CEPHALOPODA, *Cuvier*.

Order Dibranchiata, *Owen*.

(Division A.—Decapoda, *Férussac*.)

Family Teuthidæ, *Owen*.

Loligo, *Schneider*.

Loligo vulgaris, *Lamarck*.

Sepia loligo, ? *Linné*.

Habitat.—Occasionally met with in our Firth. I have only seen it alive on the east coast of Bute, where the fishermen stated that it was at times abundant. Their

name for this and Eledone cirrosa (the only two Cephalopods they are familiar with) is "Squib."

British distribution.—From Aberdeen (*Macgillivray*) to Cornwall (*Borlase*), and round the most of Ireland. It probably frequents all our waters.

Foreign localities.—Throughout western Europe, and probably extending to the Mediterranean on the one hand and Greenland on the other.

(Division B.—Octopoda, *Leach.*)

Family Octopidæ, *D'Orbigny.*

Octopus, *Lamarck.*

Octopus vulgaris, *Lamarck.*

Sepia octopodia, *Linné;* Polypus octopodia and P. antiquorum, *Leach.*

Habitat.—Probably scarce in our Firth. I have only seen one example, lying dead on the shore at Toward. One was obtained last year in Rothesay Bay, one lately in Millport Bay, and a few others have been noticed from time to time. Public interest having of late years been aroused regarding this animal, we may expect more frequent notices of its occurrence in future. As is well known, it "'plays a conspicuous part" in an exciting episode in one of M. Hugo's recent novels.

British distribution.—Chiefly southern, being rather common in the Channel Islands, and ranging as far north as the Firth of Forth.

Foreign localities.—From the French coast southward throughout western Europe, and as far as the Canaries; common in the Mediterranean, where it grows to a large size and is used as food, but chiefly by the poorer classes. Forbes (in "Travels in Lycia") says that when properly dressed "it makes a dish by no means to be despised, excellent in both substance and flavour." A recommendation of "roast porcupine to follow" rather shakes one's belief in the Professor's taste.

Eledone, *Leach.*

Eledone cirrosa, *Lamarck.*

Octopus cirrhosus, *Lamarck;* Sepia octopodia, *Pennant* (but not *Linné*); Octopus octopodia, *Fleming;* Eledone ventricosa, *Alder;* Eledone Pennantii, *Forbes.*

Habitat.—I have taken two examples in 10 to 12 fathoms

off Shelibole, Cumbrae, and have occasionally seen it brought ashore in trawl refuse by fishermen. Mr. Barker, Curator of the Rothesay Aquarium, states that fine specimens are obtained in Rothesay Bay. The mild intelligent aspect of its cow-like eyes is very remarkable, and redeems to some extent the appearance of an animal usually described as repulsive.

British distribution.—More or less common on all the Scotch coasts and north-eastern England, becoming less plentiful in the south and south-west.

Foreign localities.—Norway and Sweden (*Lovén*, and others). It is erroneously recorded from the Mediterranean and Ægean Seas by Forbes.

APPENDIX.

Being a List of Species not included in the foregoing pages, but recorded in the Catalogues of the earlier explorers of our Firth.

In deference to the usual custom, the following List is here given. No comment has been added, as I prefer leaving the reader to weigh for himself the value of the authorities given.

For convenience, the List has been divided into three groups, viz.:—*(a)*, Such as have been recorded on authority of a trustworthy nature; *(b)*, such as depend on doubtful or insufficient authority; *(c)*, exotic, fossil, fragmentary, and unrecognisable species.

In all cases synonyms have been suppressed.

(a).

Pecten furtivus (Testæ), *Norman*, Loch Fyne.
Scrobicularia intermedia (nitida), *Smith* and *Norman*, Loch Fyne.
Sphenia (Mya) Binghami, *Smith*, *Landsborough*, and *M'Andrew*.
Propilidium ancyloides, *Smith*, *Martin*, *Forbes*, *Landsborough*, and *W. Thomson*, dead shells, Lamlash Bay.
Rissoa tenuis (albella), *Alder*, Rothesay.
Odostomia excavata, *Smith*, *Landsborough*, and *Norman*, dead shells, Lamlash.

(b).

Pinna pectinata (rudis), *Smith*, *Landsborough* and *Martin*, Lamlash and Skelmorlie.
Mytilus phaseolinus, *Smith* and *Landsborough*, Lamlash.
Crenella decussata, *Smith* and *Landsborough*, Lamlash.
Arca tetragona, *Smith*.

Cardium aculeatum, *Smith.*
Cardium rusticum, *Smith.*
Tapes aurea, *Smith, Landsborough,* and *Bryce,* Ayr and Arran.
Psammobia vespertina, *Smith* and *Landsborough,* Loch Ranza.
Donax anatinus (vittatus), *Smith* and *Landsborough.*
Donax trunculus, *Smith.*
Mactra stultorum, *Smith* and *Landsborough* (possibly Pennant's M. stultorum = subtruncata).
Scrobicularia tenuis, *Smith* and *Norman* (consigned to the list of doubtful species by Mr. Norman in his appendix).
Ceratisolen legumen, *Smith.*
Solen marginatus (vagina), *Smith.*
Pandora obtusa (inæquivalvis), *Barlee,* Loch Fyne (not since confirmed).
Pholas dactylus, *Smith.*
Pholas candida, *Smith* and *Fraser,* Bute.
Teredo navalis, *Smith.*
Teredo megotara, *Smith* and *Landsborough,* Arran.
Dentalium Tarentinum, *Smith.*
Fissurella reticulata (Græca), *Smith, Bryce, Greville* and *Miles,* Lamlash.
Trochus exiguus (exasperatus), *Smith,* Ayr.
Trochus alabastrum (occidentalis), *Smith* and *Eyton,* Lamlash.
Phasianella pulla, *Smith.*
Rissoa crenulata (cancellata), *Smith* and *Landsborough,* Ayr and Lamlash.
Rissoa calathisca (calathus), *Smith* and *Landsborough,* Cumbrae and Lamlash.
Rissoa costulata, *Smith* and *Landsborough,* Lamlash.
Rissoa vitrea, *Smith* and *Landsborough,* Ayr and Lamlash.
Rissoa semistriata, *Smith* and *Landsborough,* Lamlash.
Rissoa (Barleeia) rubra, *Smith* and *Landsborough,* Lamlash.
Truncatella Montagui (truncatula), *Smith,* Ayr.
Aclis unica, *Smith* and *Landsborough,* Lamlash.
Odostomia plicata, *Smith,* Bute.
Odostomia clathrata, *Landsborough,* Lamlash.
Murex erinaceus, *Smith,* Bute and Ayr.
Fusus Norvegicus, *Smith,* Bute.
Mangelia (Pleurotoma) attenuata, *Smith* and *Landsborough,* Arran.
Mangelia (Pleurotoma) Trevelliana, *Smith,* Ayr.

Marginella lævis, *Smith*, Ayr.
Pleurobranchus membranaceus, *Smith*.
Conovulus denticulatus (Melampus myosotis), *Smith*.
Otina otis, *Smith* and *Norman*, Lamlash Bay.
Spirialis Flemingii (retroversus), *Smith* and *Landsborough*, Lamlash.
Loligo media, *Smith*, Ayr.
Sepia officinalis, *Smith*, Ayr.

(c).

Cardium medium, *Smith*, exotic.
Astarte arctica, *Smith*, fossil.
Tellina punicea, *Smith*, exotic.
Tellina incarnata (squalida), *Smith*, *Landsborough*, *Alder*, and *Norman*, single valves and fragments.
Tellina prismatica, *Smith*, not recognisable (Scrobicularia prismatica being previously catalogued).
Thracia convexa, *Smith* and *Alder*, single valves and fragments.
Natica pusilla (Grœnlandica), *Smith*, doubtless fossil.
Cerithium subulatum, *Smith*, exotic.
Cerithiopsis Islandicus, *Smith*, not recognisable.
Cerithiopsis Norvegicus, *Smith*, not recognisable.
Buccinum (Nassa ?) hepaticum, *Smith*, exotic.
Mangelia lœvis, *Smith*, not recognisable.

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